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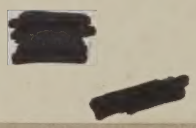

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GREGORY STRAGNELL, M. D.

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Clinical Study of Vascular Spasm*

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That the condition of vascular spasm is a rare one is well attested by a careful review of the literature: in fact, its rarity is remarked upon by no less a person than Sir Clifford Allbutt. It is mentioned especially in conjunction with intermittent claudication, which is in reality one local example of the condition. As accuracy in diagnosis is the aim of all of us, as upon it depends both treatment and the latters' results, vascular spasm, or angiospasm, must be borne in mind when one is examining cases in which there is present either a hemiplegia, or a monoplegia or aphasia—not to mention edema of an extremity, acute phlebitis, cellulitis or lymphangitis.

With these facts in mind it seemed to me worth while to record a short series of cases which have come under my observation within the past two years.

Angiospasm is seen most frequently in arteriosclerotic patients, though it is not confined entirely to them. Osler is of the opinion that Peabody best explained the condition when discussing the cerebral symptoms of arteriosclerosis by stating that there occurs spasmodic contraction of the muscular coats of the middle cerebral artery or its several branches which in connection with the narrowed lumen (caused by the sclerosis) leads to a decreased blood supply to the brain tissue supplied by the affected artery. The condition may be of short duration and frequently recurs; according to Allbutt, it may terminate in occlusion and thrombosis, generally partial, owing to the lateral projection of the proliferated coat. That Peabody's explanation, noted above, is a correct one, will be brought out in an article soon to appear; a surgeon exposed a vessel in spasm.

It is of interest that André Thomas established in his studies on inducing angiospasm the following symptoms: cramps, numbness, decrease of the local temperature, and disappearance of pulsations. Our findings in some of these cases coincided with his. Exercise does undoubtedly cause spasm—due partly at least to the fact that the amount of blood supplied does not correspond to the demand for the work performed. Intermittent claudication associated with arteriosclerosis frequently appears between the ages of twenty and forty and is of toxic origin, resulting from rheumatism, syphilis or nicotine. The blood pressure readings were subnormal, a fact which is in agreement with the observations of Bernheim.

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CASE REPORTS

CASE I.—W. F., aged sixty, admitted to the Episcopal Hospital, April 11, 1922. His chief complaint was numbness, which began the previous day while putting in a gas pipe. He noted a tingling sensation in the left arm and left leg, quit work, walked a few squares and went to bed. Soon there developed a total paralysis of the left leg and partial involvement of the left arm, and the patient was sent in by his family physician. His past history was negative, save for pneumonia at twenty. The patient was a laborer, and denied the use of either alcohol or tobacco.

His father had died at sixty-five with a similar attack, his involvement, however, having been the right arm and right leg and having lasted five weeks. At forty his nephew had a similar attack, lasting three or four months,—the patient was unable to recall the extremities involved. His mother died at sixty-five of "softening of the brain."

Interesting features of his physical examination were: heart, hypertrophied to nipple line, weak muscular tone with accentuated pulmonic second sound, paralysis of left leg and left arm except that there was a slight movement of the fingers. There were no retinal hemorrhages.

BLOOD PRESSURE

	S.	D.	Arm
On admission	130	75	Right
	110	55	Left
April 19, 1922.....	120	55	Right
	145	70	Left
April 21, 1922.....	135	55	Right
	130	45	Left
April 27, 1922.....	140	55	Right
	130	60	Left

During his stay in the hospital he responded promptly to external heat and supportive treatment. Motion slowly returned and he was up and around the ward several days before his discharge. The patient was discharged April 29, 1922.

CASE II.—W. V. C., aged sixty. Admitted to the Episcopal Hospital May 24, 1922. His chief complaint was weakness followed by partial facial

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paralysis. It began on the morning of the day of admission, while he was working. The first thing he noticed was pain with partial paralysis of the right side of his face, facial movements being very weak. He was sent to the receiving ward immediately with the partial paralysis noted above, and also weakness of the muscles of both arms. He also complained of headache and muttered incoherently. Aside from that his symptoms were negative as were his previous medical history and family history. His social history is that he was an electrical assembling worker; however, he never worked in lead. The salient features of his physical examination were slight hypertrophy of the heart just within the nipple line, the apex beat being in the fifth interspace. The muscular tone was noted as being fair. The ward notes, dated the day following admission, state that there was no noticeable weakness in any groups of muscles. The eyes showed a slight tendency to oscillatory and lateral nystagmus. The left pupil did not close tightly.

On admission his blood pressure was 135 systolic, 75 diastolic, which arm used was not stated. However, on the day after admission it was 130 systolic and 75 diastolic, in both arms. On admission his temperature was 99.3°, pulse 80 and respiration 20. During the six days he was in the hospital his temperature ranged between that on admission and 97°, while the pulse rate was between 60 and 72. All laboratory findings in this case were negative. The patient was discharged June 6, 1922, in extremely good condition.

Case III.—J. McC., aged sixty-four. Admitted to the Episcopal Hospital March 24, 1922. Complained of pain in left chest, pain and weakness in the left arm, and the left foot was swollen from the ankle to the knee. The history of the present illness as noted in the hospital records is entirely barren of any symptoms having a bearing upon the subject of vascular spasm with the exception of the fact that the patient noticed weakness in his left arm. Therefore, the deductions are made from our findings. The social, previous medical and family histories also were negative and valueless as far as our records are concerned.

The physical examination showed the teeth to be in extremely bad condition. The heart was enlarged and muscle tone weak. The eyes showed a slight dilatation of the right pupil. The blood Wassermann was negative. The urine was typically that of an arteriosclerotic, namely, a trace of albumin, low specific gravity, and an occasional hyaline cast. Phthalein elimination was thirty per cent. for the first two hours. Blood urea nitrogen and differential blood count were negative. Red blood cells 3,630,000, white blood cells 21,920. The spinal fluid examination was negative, except that the fluid was under increased pressure. Dr. Kraus, the ophthalmologist, states the disc of the eye was very gray and there was a pulsation of sclerotic vessels. The temperature in the left popliteal space was 97.2°, while that in the right was 95.2°. This difference was noted until May 8th, after which the temperature became even. Before the latter event, there was considerable edema in the left leg. After some improvement from the treatment indicated as a result of his examinations, he was discharged May 19, 1922, our feeling having been that our data and findings were sufficient to warrant his being in the classification of cases mentioned in this paper.

Case IV.—F. B., aged sixty-seven. Admitted April 6, 1922, to the men's medical ward, Episcopal Hospital, with a diagnosis of subdural hemorrhage. The hospital records state that the history of the present illness and in fact all history was unobtainable on admission as the patient was unable to talk, yet understood all commands.

The physical examination showed his teeth to be in extremely poor condition and there was also a pulsation in his neck. The heart was normal in outline and there were no thrills, murmurs or shocks. The abdomen and extremities were negative. The eyes reacted normally to light, but there was a nystagmus to the left and also slight asymmetry to the left. Patellar reflexes were exaggerated. Suggestive Babinski reflex on the left side. The spinal fluid examination was negative, except that the fluid was under moderately increased pressure. The eye examination by Dr. Fewell, the ophthalmologist, was as follows: Pupils dilated—right six mm., left three; color, well defined. Arteries seem reduced in calibre, showing a moderate sclerosis. No discreet lesions in the fundus. O. S. the same. The urine and blood examinations were negative. The blood pressure was 150 systolic, 95 diastolic, in both arms.

The temperature while in the hospital varied between 100° first few days to normal. The pulse was 96 on admission, but soon became normal. The patient was treated with heat and stimulation and his condition improved steadily so that at the time of his discharge, May 27th, he was able to walk around the ward and seemed to have regained the complete use of all the disabled members.

Case V.—M. M. Admitted to the men's medical ward of the Episcopal Hospital June 28, 1923, with a diagnosis of intermittent claudication. Patient stated that while walking down the street three weeks before admission he suddenly felt a sharp pain in the calf of his right leg, so sharp, in fact, that he thought something had struck him. The weakness and pain became more marked and he went home and then to bed. The leg became swollen and extremely warm from the knee joint to the ankle and was sore for about two weeks. The condition improved and he was able to be up and around, but could walk a short distance only, suffering no pain at that time. However, two days before his admission he had another attack of pain similar to the previous one and the leg became swollen again. There were no other cardiovascular symptoms and the remainder of the history, both as far as his family and social histories were concerned, were negative. Previous medical history was also negative as far as acute infections were concerned. He had been a moderate tobacco user, but denied having ever used alcohol.

Physical examination was negative, except that the heart sounds were distinct and of fair quality. The right leg from the knee down showed edema and ecchymosis and pitted on pressure. There was also slight tenderness on deep pressure on the calf of it. The temperature of both the right and left leg was identical and both anterior and posterior tibial arteries pulsated. The blood pressure was not re-

corded. Pulse rate during his stay in the hospital varied between 84 and 76, while his temperature was practically normal. Uranalysis and blood count were negligible. The ward notes state that by July 2d the edema in the right leg had decreased markedly and the yellowish discoloration was disappearing. After application of dry heat his condition improved so markedly that he insisted upon being discharged on the 5th of July, contrary to medical advice.

CASE VI.—J. B., aged fifty-two. Admitted to the men's medical ward of the Episcopal Hospital July 6, 1923. The history was of his having fallen unconscious in a trolley car while on his way to work. Before that time he suffered from headache and mental confusion. While standing on the platform of an elevated car he felt dizzy, had a sharp frontal headache and then became unconscious and remained so until he was brought to the receiving ward of this hospital. He stated that he had had several similar attacks within the last few years.

The patient was a police officer. He drank four cups of coffee a day with an occasional drink of whiskey. Other previous medical and family histories were negative, except when he had these previous attacks he did not void urine, did not froth at the mouth, did not have convulsive movements and did not bite his tongue.

Physical examination showed that the heart was enlarged to the left and the muscular tone was fair. There was a definite sclerosis of the upper vessels of the arm. Laboratory reports were entirely negative. Blood pressure was 124 systolic, 65 diastolic.

This condition improved while resting in bed and we were unable to persuade him to stay in the hospital longer than the eleventh of April.

TREATMENT

The treatment of vascular spasm consists of complete rest in bed, liquid or semisolid diet, continuous application of heat to involved areas and supportive medication.

In arteriosclerotic patients potassium iodide is indicated, while in many cases tincture of belladonna is advised. Morichau Beauchant has advised the use of sodium citrate three to four gm. over long periods.

SUMMARY

1. Vascular spasm is rare.
2. Intermittent claudication is a local example of the condition.
3. It must be borne in mind when any hemiplegia, monoplegia, aphasia, or unilateral edema is seen.

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A complete bibliography will appear in the author's reprints.

Galvanic and Faradic Electricity and Derived Currents in General Practice*

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I shall confine my paper to galvanism, the basis of all electrotherapeutics, faradism and derived currents. We must bear in mind that historically static electricity has been longer connected with medicine than the currents just mentioned. Wickham has said that it is not what is in the machine which interests us as physicians but what comes out of it. I shall, therefore, take this hint. You will, however, permit a few preliminary details of physics as a basis of understanding what follows.

Galvanism is the employment in living tissues of a direct continuous current of electricity. By direct, we mean always flowing in the same direction throughout the application. A current of electricity is conceived of as the flow of electrons from the negative pole of the generator through an external path called the external circuit, back to the positive pole of the generator; the generator resembling a pump and the flow of electrons or current of electricity, a stream of water. For this conception we have mathematical, experimental and practical confirmation.

Benjamin Franklin, before the electrons were known, decided that there were two kinds of electricity, negative and positive, and also that the current flowed from the positive to the negative pole in the external circuit. This need not confuse us, since we always speak of the sun as setting, knowing that in reality it is the western horizon rising. The electrons, therefore, flow from the negative pole or cathode to the positive pole or anode. Cathode means the way down and anode means the way up, also figurative terms.

Comparing electrons to molecules of water and the earth's electrical capacity to sealevel—the generator or sun separates the electrons or molecules of water and by its power raises the water to a high altitude, the electrons to a high state of electrical potential. When the water seeks sea level again, it can give back the energy imparted by the sun, to run mills and hydroelectric plants. In the same way the electrons seeking the earth level or condition of electrical neutrality can give up energy to the various agents in their path, causing heat and incandescence, magnetism, mechanical motion and chemical changes called electrolysis, and when applied to living tissue such physiological changes as sensation of heat and pain, sedation with analgesia, muscular contraction, hyperemia, increased metabolism and nutrition with growth or destruction and necrosis.

When the circuit is continuous from cathode to anode it is said to be closed and when it is interrupted so that the current cannot flow it is said to

*Read before the Medical Society of Bay Ridge, N. Y.

be open. We close a switch to cause the current to flow and open it to stop the current. This is opposite to a valve or faucet. The higher the source of the water fall the greater the power; and likewise, the more potential difference between the two electrical states of positive and negative the greater will be the electromotive force. Water power may be measured in terms of waterfall height; electromotive force is measured in volts. The current is measured not in electrons but in amperes, just as we measure water not in drops but in gallons. And we speak of the current flow in terms of amperes per second. In medical usage milliamperes are found the more useful units. The total quantity of electricity delivered is measured in coulombs and is found by multiplying the number of amperes a second by the number of seconds during which the current flows. A milliampere flowing for one second delivers only one milcoulomb of electricity.

Now anything which obstructs the flow of the electrons is technically called resistance. Different substances offer different resistances to the passage of electrons. Those with the greatest are called poor conductors or insulators or dielectrics. Lengthening the circuit, decreasing the size of the conducting path, as making the wire smaller in diameter and introducing substances having great resistance, such for example as the dry skin, will reduce the quantity of current passing through the circuit and require a longer time or more voltage to obtain a given number of coulombs and the desired physiological effect. Resistance is measured in ohms.

The relation between electromotive force (measured in volts), the number of amperes in the current (expressed as ions) and the amount of resistance (expressed in ohms) is known as Ohm's law. One volt will force one ampere of current a second through a resistance of one ohm. To reduce the quantity of current we introduce resistance by means of a device called a rheostat. It is analogous to the valve in a pipe. When all of the resistance is thrown in we have no current. To increase the current when we increase the resistance, as when the body is placed in circuit, we increase the voltage. Poor connections between the apparatus and the rheophores (wire cords) or between them and the electrodes or between the electrodes and the body all increase the resistance. This is not desirable. We must have good conductivity by means of good contact at all junctions in the circuit. When resistance occurs the voltage is transmuted into heat, the degrees of heat being directly as the square of the amperage. This is Joule's law.

Every apparatus has a maximum of voltage and of milliamperage, beyond which you cannot go. This should be known. Every piece of apparatus has regulating buttons or sliding buttons with scales. The scales show usually the parts into which the total output of the machine as maximum may be divided for administration. The voltage and milliamperage given at any moment is disclosed by a voltmetre and a milliampere metre respectively. They are essentials to the amount of the dose.

When a patient is placed in the circuit with a direct, continuous current of electricity we notice certain effects in the tissues between the electrodes which are called the interpolar effects, and certain effects which are different and characteristic at each electrode called the polar effect. The polar effects are true of galvanism only.

To digress for a moment, we are all aware of the fact that living bodies consist mostly of fluids, flowing in channels and confined in cells. These fluids are mostly watery solutions of sugars and colloids or salts and bases. We know that the salts are electrolytes, that is will carry the electrical current by reason of the fact that they are always ionized in solutions according to certain invariable laws; we know that the degree of acidity and alkalinity are measurable chemically by optical standards and electrically in microvolts as hydroxyl and hydrogen ion concentration, the latter being made use of as a standard unit for comparison of the degree of acidity of body fluids.

We are sure that with moderate currents there are some interpolar nutritional effects due to heat generation according to Joule's law. Experiments of various sorts show that the chemical changes are appreciable only at the electrodes connected with the poles. If, however, our dose is increased in milliamperes or time beyond that which the tissues can pass and live, then we have an electrolytic effect which is due in part to chemical dissociation and in part to heat engendered by the resistance of the tissues to the current. The polar effects are chemical and thus physiological and pathological and they are characteristic for each pole.

The electrode attached to the positive pole attracts and liberates oxygen gas, acid radicles and the halogens from their compounds in the tissues and in solutions containing them. This pole is therefore always acid in reaction and will turn blue litmus paper red.

Acids coagulate albumen; hence, we have a shrinkage of tissues, clots are formed, hemorrhage and lymph oozing are checked and, if prolonged, a caustic necrosis results with consequent hard, firm scar. Positive electrodes will stick to mucous membrane. The acid condition is sedative to nerve endings and nerve tissue, which condition is called anelectrotonus. Bacteria are also killed, and putrefactive and necrotic conditions are rendered aseptic.

All i ns which seek the positive pole or anode are called anions from ἄνδ up and ἰὼν to travel, and, since unlike signs attract, they must be electronegative. This gives us the key to another fact, namely, that the nucleus of a cell staining with an acid dye must be electropositive.

Since like signs repel, metals and bases are separated electrolytically from their compounds in solution when applied upon electrodes attached to the positive pole and are driven into the tissues. This action is called iontophoresis. It is sometimes called cataphoresis or anaphoresis, which are meaningless terms, and ionization, which is something entirely different, and ionic medication, which should be iontic medication.

Lithium, zinc, copper, magnesium, silver, mercury, iron, and other metals, morphine, atropine, quinine and other alkaloidal radicles are separated as ions from their compounds with acid radicles and are driven into the tissues by the positive pole.

A two per cent. solution in water of the sulphate of the metals or a ten per cent. solution of the hydrochloride of the alkaloids is used.

We now know that none of these ions is driven far into the tissues and that the greatest effect is upon the surface where applied. The heavier ions are usually deposited in the skin as albuminates and the current is then carried by the lighter ions of the body juices, particularly the hydrogen ion. However, as the capillary stream rapidly carries off the lighter ions, in the case of the more powerful alkaloids for example, we may get systemic effects, but this is a poor way to administer drugs.

Zinc, copper and silver are germicidal and when added to the germicidal effect of the positive pole are doubly effective. Where reachable by these solutions or by means of copper or silver or zinc electrodes, all infective foci are readily sterilizable. Sinuses, boils and carbuncles, middle ear infections, especially if discharging, urethral and bladder infections, uterine and vaginal infections, pus tubes and prostatic inflammation, conjunctival, nasal and oral infections, ulcers and gangrenous conditions are amenable to this treatment.

The anodyne, or anelectrotonic effect makes this pole appropriate for neuralgias and neuritis. Its coagulant effect makes it indicated in bleeding from all accessible organs, as nose bleed, metrorrhagia and menorrhagia, especially when duè to fibroids, by the method of Apostoli. In cases of subinvolution and postpartum hemorrhage this pole is especially valuable. Neiswanger has also employed it with good effect in extrauterine pregnancy to destroy the product of conception. It is valuable in shrinking hydrocele and other cysts, as wens, nabothian gland cysts, and cystic goitre. Adenitis, whether tuberculous or chancroidal, especially after necrosis with fistulæ, is amenable to this pole. Magnesium ions have a particular applicability to warts and are also sedative. Lithium, sodium, potassium, magnesium, etc., are better given otherwise for systemic effect, as the amount administerable by electricity is inadequately small. Quinine ions have been found valuable in trigeminal neuralgia and herpes zoster, while zinc and mercury with an electrolytic current are valuable in malignant growths.

The electrocoagulation of the blood in aneurysmal sacs by means of many feet of fine copper, gold or silver wire introduced into the sac and used as the positive pole upon which the clot forms has been accomplished with partial success (1).

The contraindications for positive galvanism are scar and fibrous tissue, such as ankyloses and strictures and all conditions requiring softening and hyperemia or which are made worse by shrinking and where we do not desire the effect of the metallic and alkaloidal ions.

The electrode attached to the negative pole liberates hydrogen and forms hydroxyl, hence the reaction of the tissues is alkaline, the tissues are hydrated, softened and become hyperemic, hence swell and their nutrition is increased. The alkaline reaction is painful and stimulating, causing the condition of nerve reaction called catelectrotonus. Bleeding and oozing are favored and, if prolonged, a caustic colliquative necrosis results with a consequent soft, pliable scar. Bacterial growth is favored, scar tissue is softened and metals and alkaloids are separated from compounds in solution by this pole, while acid radicles and halogens are repelled, which is called anaphoresis.

All ions which seek the negative pole or cathode are called cathions, meaning cathode seekers, hence they are electropositive (unlike signs attract). The negative pole is therefore used to destroy tissue where we do not desire scarring, as in warts, moles, superfluous hair and nevus, or to soften scar tissue, as in strictures, lachrymal, esophageal, urethral or elsewhere; or in burns, Dupuytren's contracture and false ankyloses, or pterygium and corneal opacities. In infantile uterus it is valuable when combined with the galvanic sinusoidal, and for dysmenorrhea due to contracted os or adnexal adhesions or endometritis it has no substitute.

It is used to drive in iodine and chlorine, which are both antiseptic, while the latter is softening to tissue and the former is useful in goitres of adolescence and actinomycosis. The use of negative galvanism to a swollen breast will relieve a mastitis and so differentiate between a benign and a malignant condition. An inflammatory condition is made painful, while a noninflammatory condition is soothed.

The negative pole is contraindicated where there is hemorrhage or oozing or edema, or where we desire a firm, tough scar, or where we desire a shrinkage of tissue or the use of the anions for their medicinal or antiseptic effect. The use of the galvanic current for the relief of lead, silver or mercurial poisoning is without effect therapeutically. Iodine, however, will separate out at the positive pole when ingested as iodide by the mouth. This is much feebler than the opposite method of negative iontophoresis.

The dose in any case is determined first by the tolerance of the patient, as governed by the sensitiveness of the tissue traversed. A few milliamperes at the beginning of treatment usually increase during the treatment, as the skin becomes a better conductor when moist. Next, the time of treatment should be of sufficient duration to destroy all the pathological tissues at one session when electrolysis is used. This does not apply to removal of hair where only a few can be removed at a session. In other cases not less than fifteen minutes and in some cases even an hour may be necessary. The sessions should be spaced according to the degree of reaction—usually every other day—when treating pelvic conditions or strictures or scar tissue. It is best to begin with small doses, tolerable to the patient, five to ten ma. for five minutes and increasing cautiously. With inflammatory and purulent conditions, the time may be lengthened to thirty minutes or more and the treatments may be even twice in one day, as in carbuncles and boils.

IONTOPHORESIS

Shoemaker (2) says that the indications for iontophoresis are, 1, to produce local anesthesia for neuralgia, superficial pains and for cutaneous operations; 2, for topical medicamentation; 3, to facilitate absorption of medicines from baths; 4, for diagnostic purposes.

The subject of iontophoresis has for a long time

produced considerable literature, some of it valuable for its scientific quality, some of it valuable for its clinical results, without undertaking to evaluate the explanations attending the reports, and a great deal of it speculative and repetitional of previous faulty observations. A recent report (3) will give us possibly the most accurate résumé of this procedure. The protocols of their experiments are worthy of study.

They studied the following problems: The influence of the electrical current *per se*. The effect of similar applications of the drug without the current. The influence of the current in the absorption of metals. Likewise on the absorption of alkaloids and glucosides. Likewise upon the absorption of halogens, nonmetals and acids. Detoxication of the body by means of the electrical current. The treatment of infections by experimental electrolysis.

They discuss the pros and cons of medicamentation by iontophoresis as follows:

Pro.—The drugs are not subject to digestive changes as with oral administration. With hypodermic administration the drug follows the fluids and is quickly absorbed or excreted. The local effect is preponderant and is to be desired when it is not advisable for a systemic distribution of the drug. Larger quantities therefore can be applied locally and into the tissues than with external applications alone.

Contra.—The absorption of ions with the electric current is not satisfactory where systemic results are desired. The local effect of anesthetics is temporary and very superficial. The doses are variable, the application often disagreeable or painful and there is danger of caustic burns with slowly healing ulcers. Cataphoresis, implying an electrical osmosis or liquid flow from anode to cathode, is molecular rather than ionic, slow and is at present to be largely disregarded. They quote approvingly Clark's conclusions, which are: "The application of the galvanic current alone, without the use of remedial drugs, is often of benefit in various pathological conditions due to interpolar ionization of the tissue constituents, thereby altering nutrition, improving metabolism and producing stimulation or sedation, contraction or dilatation depending upon the polarity.

1. The electric current may be used to introduce ions into the skin. The transference depends upon the factors of amperage, voltage, resistance of the tissues, time and area of application, the chemical nature of the ion and its migrational velocity with the current. The heavy metals enter into insoluble and noniontic compounds in the vicinity of their port of entrance and give up their charges to other faster moving ions in the tissue fluids. Their effect is therefore purely local. They can be used for this effect only.

2. The electric current facilitates the introduction of many alkaloids through the skin. a. The physiological effects of strychnine and pilocarpine were obtained in rabbits after an hour. b. The physiological effect of caffeine and curare as gauged by systemic effects was nil after two hours. c. The action of curare, picrotoxine, strychnine, veratrine and nicotine was accelerated when introduced through the skin of live frogs. d. Using a current of two ma. for ten minutes, cocaine produced a moderate but incomplete anesthesia of the skin of a finger lasting an hour, procaine and butyn produced a mild anesthesia lasting about half an hour, while benzylcarbinol and salicin failed to produce any symptoms of anesthesia. 3. Halogens, nonmetals and acids vary in penetrability, some (CN_1) being accelerated, while others (NO_3, salicylic acid) are negative.

4. The theory of detoxication of poisonous ions by electrolysis is fallacious and not demonstrated, as they are of a slower moving class and readily superseded by the more rapid ions H, Na, Cl_2, I_2.

5. The release of nascent iodine at the positive pole in the tissues after ingestion of iodides may possibly be utilized in certain infections, but the ordinary electrical current produces changes sufficiently drastic, according to the pole employed, to give equally beneficial results."

W. J. Turrell (4), of Oxford, England, has also summed up the matter in a recent paper. He says that the therapeutic value of medicamentation by drug ions is nil and any therapeutic effect is entirely due to the well known physical action of the galvanic current. Drug or other ions are not carried into the tissues deeply, but only just beneath the skin. The claim that salicylic ions, for example, can be administered by galvanism into a joint with the opposite poles on either side of the joint is straining credulity to the breaking point and is not borne out on theoretical physical grounds nor by experiments which were supposed to prove that effect. "The method has nothing to recommend it in preference to the usual and more simple modes of oral administration, hypodermic injection and inunction." He attributes the interpolar effects, which others have ascribed to iontophoresis, to the heat engendered according to Joule's law. In this he is corroborated by Campbell (5), who goes further, however, and suggests that the beneficial effect is due to the stimulation at the electrodal poles. This would place the mustard plaster upon an equal plane with galvanism in its anodyne effects, which of course is not so.

Inchley (6) reports a series of experiments in iontophoresis. His summary is:

"1. Both positive and negative ions can be absorbed through the skin or mucous membrane by means of the electric current, if a solution of the drugs be applied at the appropriate pole.

2. The current is conveyed through the body by the tissue ions; after the introduction into the body of foreign ions the current has no further appreciable influence upon them."

To what are we to ascribe the effects which clinical observers have interpreted as due to the entrance of ions deliberately administered for specific effects? I believe we will be correct in not brushing aside as unscientific their observations because of apparently conflicting physical laws, but in believing that there is something which the physicist must not lose sight of, namely, that we are dealing with living tissues and that in some cases the administration locally by electricity of certain ions is not only more effective than by inunction, and that by way of the lymphatics and blood stream some of the finely divided ions lodge in selected tissues without trauma and more accurately than from hypodermic injection.

(*To be concluded*)

The Old Age Factor in Psychoanalytical Therapy*

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In the present communication no attempt is made to cover the entire ground of the suggested title. Such an effort could advantageously take up the entire pages of this issue. Even limiting the discussion to the presenium and the senium, as is here purposed, so many important issues are involved that a complete discussion is equally impossible.

In the first place one might attempt to outline what is meant by age. In a manner of speaking some individuals are old, i. e., worn out, almost at birth, and at the opposite pole of life, many an old one is still youthful. In other words, as Ward Crampton in recent years has quite interestingly pointed out, what the classical author of *De Senectute* has said some millenia before him, the chronological age of an individual is not a necessary index of his physiological age. And if one would reach out still further it may be stated that even physiological senescence is not an absolute criterion for psychological deterioration.

Thus the literati tell us that Conrad began his career at fifty, and tradition still tongues the anecdote that Gladstone started to learn Greek some ten years later. Whom the "gods love" may "still die young" and Mozart, Keats, Shelley and other names spring to the fore as illustrative of the early burning out of some men of genius, yet on the other hand many a chronological dotard has offered to the world surpassing spiritual gifts of enduring social value. To enumerate them is unnecessary.

The most orthodox old saw runs that "man is as old as his arteries," and the name of Osler has been widely traduced as saying that "sixty" is the proper chronological stadium for chloroforming. Taken all in all, whereas these generalized formulations have statistics on their side, upon a larger review one cannot refrain from the counter attack apropos of mathematical absolutes, that the three advancing categories, "Lies, damn lies, and statistics" more correctly states the actual truth when the individual himself comes for review.

From the viewpoint of behavior then the presenium and senium, physiologically, i. e., arteriosclerotically defined, offers many an interesting problem. From the aspect of understanding the underlying motives of conduct in individual cases of medical interest and how to deal with them therapeutically the vistas of interpretation have been enormously expanded and made more definite through the teachings which have come through psychoanalysis.

As already stated, no attempt will be made here to systematize and to present in strictly logical fashion the various nuances of the numerous questions of geriatric interest which are presented now to one, now to another practitioner. Still in order not to make this communication too general it may be worth while to partially attempt to make some dividing lines between the more "normal" and more "abnormal" manifestations which may be met with in medical practice, accentuating the conviction that normal and abnormal are only convenient fictions forced upon us by practical expediencies.

As already foreshadowed the chief accent is here to be laid upon psychologically understandable modifications of behavior.

Advancing age brings with it its inevitable decline. This is the law of life that advances to death, from which no living organism, from amœba to homo, can escape. *Bios,* the old Greek word, meant both life and death; in which we see repeated throughout the evolutionary scheme of things attraction and repulsion in physics, positive and negative in chemistry, pain and pleasure in sensation, sickness and health in medicine, good and bad in ethics, and comedy and tragedy to the universal onlooker, call "it" by any name one will—God, Fate, or *Das Es.*

Psychology in its largest vision, offers some interpretative formulæ as to how human beings behave in view of this inevitableness, and this is the theme into which the present paper would enter in but a fragmentary way.

Almost every one of the younger generation has an underlying intuitive insight into the many excuses (rationalizations is the more scientific phrasing) made by the gradually older growing individual to account for his loss of grip upon reality. Whether such loss of grasp fall within the sympathetically explained "he is getting old" or passes over into the belief that the old man must be "junked" as a "psychotic," it is only a question of degree. And running true to the biological differentiation of "selfpreservation" instinctive activities, or the still more tension laden "propagation of the race" thrusts, abnormal behavioristic reactions in the aging show themselves as "compensatory" reactions in the "economic" or the "sexual" sphere.

To illustrate let us take two examples which I have been asked to adjudicate; briefly presented, as formulæ only.

Case I.—A man, sixty-two years of age. He had been a "boiler maker" all of his life and had been fairly competent up to two years before the specific situation. For reasons, too detailed to narrate, he had regressed to the level of a night watchman on the river front in the employ of a large corporation. One night he stumbled and fell upon an incoming vessel and sustained a trifling injury, somatically speaking. Shortly thereafter he was discharged since the evidence was incontrovertible he was not up to his job. Psychologically, however, his reaction was that he had been given a "dirty deal," and since the natural cupidity of his surrounding media, wife, sons, etc., supported him, a medicolegal proceeding was inaugurated to show that the injury sustained—trifling abrasions of the body—was the cause of his incompetency. He himself reacted by an excessive exploitation of the injustice dealt to him in his discharge. He dissolved in tears, emo-

*Read before the New York Neurological Society, December 2, 1924.

tionally overwhelmed by the cruelty of the corporation, and had for months sat in his chair at home, a typical picture of an "arteriosclerotic dement with compensatory paranoid ideas." As a matter of fact the injury sustained was not a competent producing cause (medicolegal requirement phrasing) of the clinical picture presented, yet this was one of the type of situations upon which the "expert," presumably myself, was called upon to decide and adjust the relative merits of the situation.

Psychoanalytically speaking the situation is quite clear, for psychoanalysis has a clearer understanding of the "selfpreservation" instinctive ego than the usual judgment of the proletariat. The two years earlier regression to the "night watchman" level is, for the neurologist, satisfactory evidence of the essential deterioration of the individual. The accident, however, is made (chiefly by the instinct of selfpreservation, the libido situation cannot be entered into here) the causative crucial point of departure from the level of efficiency. Further comment is unnecessary save that this kind of presenile and senile reaction is extremely widespread.

So much for the ego component—selfpreservation, economic aspect in a specific instance.

Now let us turn to an ambivalent (i. e., bipolar situation), also in the medico legal sphere.

Case II.—A young woman made a complaint to a policeman in the Grand Central Station that an old man of seventy, sitting by her side, with outspread encompassing newspaper as a shield, nudged her, and as she turned in response, she saw his penis revealed, erect or semideclining; who could say relative to her knowledge as to its tension. The old man was arrested and his case called for an "expert opinion."

Here the problem falls within a different category, into the intricacies of which we cannot now enter. Pathological exhibitionism is the nosological group into which the case falls. It is immaterial here to give the statistics of this type of abnormal behavior which must be dealt with by the district attorney in New York or other large city. We are, for the moment, only interested in the psychoanalytical interpretation of this type of behavior.

In the study of the present instance we have an old offender and Bellevue and the Manhattan State Hospital, more or less, sociologically speaking, adequately deals with him, but for our present discussion, the obvious outstanding dereliction is but an exaggerated example of a vast medley of similar situations varying from the palace to the hovel, to which the "innocent female" is exposed.

How does the psychoanalyst deal with these situations, first as an agent of society, and secondly as an interpreter of the instinctive impulses of the individual? In the role of an agent of society he must condemn the sick individual, not to Sing Sing, but to the Manhattan State Hospital; but secondly, he is scientifically (sociologically conserving) curious as to the specific causes of the individual's behavior. From this aspect he may find many ameliorating circumstances, in so far as he may discover, and indeed did unearth, compulsive factors dating from early childhood, which forced him to the conclusion that this type of conduct was not wittingly vicious, but unconsciously compelling. This enabled him to say the patient's behavior was psychotic and sick and not "criminal"—according to the legal definition.

But these are questions which less frequently come within the sphere of the general practitioner, furthermore they lie somewhat aside from the title of the present paper, for they are so quickly transferred to the social legal machinery that, as introduced, they should be thrust aside, in order to get to the real issues here contemplated.

The essential issue then is what kind of neurotic or psychotic behavior can be advantageously treated by the generally understood method of psychoanalysis. From this point of view, in reality, a host of situations arise, less dramatic, less tragic, perhaps, but still quite compelling, but actually representing in attenuated forms the sample cases already cited.

In the earlier years of the development of psychoanalysis, the neuroses and psychoneuroses were thought to be the special fields for the applicability of the generalizations with which Freud has made us familiar, but as time went on it developed that a general philosophy of life and its interpretations lay behind the principles so conscientiously worked out by Freud. The unconscious, long ago felt as a force underlying instinctive behavior, now came under the scalpel of specific dissection and it soon became evident that the human being really was worthy of the Nobel prize for his superior gift of "passing the buck" to himself.

Psychopathology gives the general term "rationalization" to this process and it distinguishes a great variety of grades in it. Some of it is undoubtedly physiological—for certainly if man did not have a swift cocksure answer to things, but had to inquire into the underlying "isness of the is," he could not function. Much of the stuff fed us from the cradle to the grave as education, knowledge, logic, is a crazy patchwork of these fictions, but inasmuch as they constitute the particular gilded small coin of the masses it passes muster and is serviceable in the turmoil of life. When pathological rationalizations commence to influence behavior in a manner inimical to the patient's own comfort or that of his surroundings then the problem arises how to get at these inner factors and relieve them. (4)

It is no longer necessary to attempt to boost psychoanalysis competently utilized. I listened to lectures in my medical course upon healthy laudable pus and was told that Lister was a fanatic and that antisepsis was a passing fad. And many are the pseudoprophets who have been talking the same kind of stuff for the past twenty years about Freud and psychoanalysis. There are still even today incompetent surgeons after all the years of technic, and surgical technic is crude plumbing compared to psychoanalytical technic. Still with the many great advances in psychoanalytical technic the question has become more and important as to its availability in dealing with the special medical problems of those of advancing years.

It may be recalled that Freud (1) himself raised this question early and very tentatively showed the difficulties. Whereas it is known that youth, intelligence, a certain amount of character, etc., permit one to give a better promise of help for the psycho-

neuroses, yet as has already been pointed out chronological, physiological and psychological age do not go hand in hand .Moreover the technical advances since then are offering more and more to the psychoanalytically thinking physician and the old age factor is becoming less and less formidable. Historically Abraham's paper (2) in 1920 upon the same subject is worthy of citation in that he comes to similar conclusions and cites some illustrative material, particularly emphasizing its value in the treatment of various depressed states of advanced years. He also reports an excellent result in an old compulsion neurosis. And a number of others. Abraham also speaks of failures as well and with our advancing ideas concerning the reasons for the neurotic symptoms, psychoneuroses, psychoses and unconscious psychological factors in organic disease it can readily be seen why in certain cases no success will crown the most sincere and intelligent technic.

Other communications on the subject are scanty in the literature although published case histories often show that the patients are advanced in years.

Like Abraham I have had my successes and failures and can say that I have learned caution relative to prognosis. At one time I was even as brave as a lion in the belief that "some acquaintance with the patient's unconscious would be of benefit to him in the treatment of his annoying symptoms." Now I am much more inclined to tell my older patients that disease symptoms, physical often as well as psychical, are for the most part intuitively found compensations for inner character defects; that if psychoanalytical principles be rigorously applied their most cherished beliefs and fundamental philosophies, and their consequent emotional valuations will be quite profoundly stirred and they will not like it; that they will probably curse me out and call me a quack or a shyster, but if they have real guts and can look themselves fairly and firmly in the face then much can be done for them.

Case III.—I recall being called in consultation by a colleague in this case. The patient, seventy-two years of age, had a partial motor aphasia and slight hemiplegia which had evidently been occasioned by a cerebral softening. The usual advice, etc., was given and after the acute situation had gone by some few months his physician sent him to me to be looked over.

He still had a residual difficulty in finding his words, his hemiplegia had cleared up save for slight weakness, but he was anxious to know how to live. He had had a slightly similar attack a few years previously and he partly shared the superstition, of "three out all out."

And so I talked with him from the psychoanalytical point of view. It soon was learned that during the past four or five years he had been getting increasingly violently angry; was more and more irritable and often these explosions left him all in, and the "chronic chip on the shoulder" that he carried everywhere with him got no relief from golf, or motoring, or business, or anything. He was still an active, forceful personality and we had to overhaul the whole works—which we did. He was securely well to do, hence the "selfpreservation" aspects of his instinctive life were not primarily involved; but it soon developed how he was handling in an imperfect manner a declining ability to have intercourse from nonerection, although harrassed by augmenting eroticism. This is a frequent situation in older men and when made widowers in the sixties the various clinical pictures resulting are very distressing for the patient and baffling for the physician.

In the present instance we had increasing irritability, increased blood pressure, violent outbursts—psychical, and a couple of blowouts—arterial.

That which was playing on the eroticism was an old daughter complex component. Her relations with the father were very cordial and pleasant, but she was not as wise as she might have been in periodically permitting him to get a glimpse of a difficult marital situation with herself. Every time this was brought up, he was extremely kind and helpful—gave her advice, comfort, and even money—but it soon became evident that he repressed a hatred to the son in law and "wanted" the daughter, and the response was an attack of temper—displaced over to the wife and an increase in the eroticism which by reason of the outburst on the wife found no way of satisfying itself—hence an increasing sense of frustration.

This is but a short thumbnail outline of a complex situation to which the old man caught on and soon established a better rapport with the wife, regained satisfactory relations, had it out with the son in law and got a good adjustment there; helped him over a hard bump which he had not wanted to tell the wife—eased up her friction somewhat and a much better working combination was established. He is now eighty and busy still and has had no further blowouts to date.

Having studied in great detail the fundamental psychical pathology in a patient with persistent high blood pressure, vascular crises and nephritic blowout (3) I am certain that 'psychoanalysis has a great future in straightening out some cases of this type where the internal dynamic tensions are not as great as in the case studied, and hence are better able to be managed. I feel certain that this type of understanding, which will come to be the general heritage of the profession, will be a most helpful adjunct to or substitution for present dietetic and pharmacotherapeutic procedures.

Another type of case more within the narrower neuropsychiatric frame is also thumb sketched.

Case IV.—A single woman, fifty-five years of age, stout and old fashioned came into the office all bundled up including several wraps of thick veiling over the face. True it was in January and the weather chilly but not cold. She was timid, deprecatory and sought to hide herself from observation. She was anxious, restless and emotional. She did not want to remove her veil as "her nose was so disfigured"; there were cracking noises in it. She could not keep her feet quiet, there were vibrations going on in them; her heart was palpitating at a rapid rate—124—and she had very unpleasant contractions going on, in what I learned later were her "privates."

I learned partly from her, and partly from a very petite, slim, and attractive gentlelady, a cousin of hers, seven or eight years younger, who had looked after her for the past seven years since she had been

incapacitated, and who had practically supported her for seventeen years, that about seven years before this she had had what the doctors called a nervous breakdown (menopause neurosis—two years preceding actual cessation of menstruation).

She became intensely nervous and depressed, had persistent insomnia, some loss of weight—from a previous 190 to 175 pounds (in younger days she weighed 120 to 130)—severe palpitations, especially at times at night she would wake up from nightmares with this rapid heart action, rush of blood to the head, a sick nauseous feeling in the back. But the feeling that drove her to a sanitarium at this time—seven years previously—was the unhappy depressing thought that the head and especially the nose was swelling and was growing so large that she had become an ugly old being and that everybody was looking at it. She thus was unable to travel anywhere, unless heavily veiled and had begun to be a recluse, more and more confined to her home, or to the immediate circle of her intimates.

She remained in the sanitarium the better part of a year with but little change in her condition save that with the help of bromides and other narcotics she slept much better. She had a great deal of skin irritation from the bromides and the itching became quite acute about the genitals which at times became red, swollen and eczematous.

She then led an extremely restricted life for the next six years with ups and downs. She was never quite as depressed for as protracted a period, but she continued to feel the palpitations, rush of blood to the head, irregular sleep with nightmares, the clutching sensations at the heart, and above all the persistent compulsive idea of the larger growing nose that prevented her going anywhere.

She lived with her cousin, all of this time doing some of the housework, but was a chronic invalid, attended and cared for by the selfsacrificing and classical type of New England selfeffacing sympathetic cousin. She read a good deal—in her books alone could she become absorbed and lose herself.

She came to consult me because of a growing intensity of the vaginal contractions which had been added to the general picture some six or seven months previously, and an increased intensity in the annoyance she felt about the nose being the object of everyone's attention. This obsessional thought was uppermost in her mind and unless heavily veiled she could not travel in the subway, which was the most direct and only feasible way to come to my office.

After several interviews it was clear that the patient had since childhood been "nervous" and that the nose obsession had begun as far back as her fifteenth or sixteenth year, when she first began to menstruate. She recalled that at that time she used to watch people's faces a great deal, and in looking at her own face in a mirror, which she did frequently, she noticed a white spot on the nose, and was much concerned about it. It was not acute, however. Again at twenty she had a period when she thought it swollen and was growing larger. While cooking in the kitchen the idea would be more persistent. "She always had admired pretty noses." "She liked dainty features—hated coarse features." There were a series of recurrent compulsive thinking periods in which the nose was a prominent feature, and there were other episodes of a general anxiety hysteria character all throughout an extremely difficult and complicated life history.

This life history is too complex and varied to detail and only a few salient features need accenting. Her father, a visionary son of a previously well to do family, who had gone west to make a fortune in gold mines, died when she was eleven. Her mother had left her father when the patient was but seven years of age. She was then cared for by grandparents, and aunts and then by the uncle, father of her present friend. This uncle had been one of the trustees in a considerable estate. She had lived in several states of the Union in all of this going and coming, had never had a settled abode save as housekeeper for her uncle, and mother to the little cousin until she was about eighteen. The uncle had discouraged all male friends and finally she had come east with the cousin after the uncle's death. This same cousin having the much diminished residue of the whole family estate which had been the object of untold bickering, expensive litigation and heartaches of the well known character.

The patient rather quickly established a type of childish clinging transference, wrote frequent notes of questions, and dreamed abundant dreams of a very simple nature. Thus were shortly established many of the well recognized individual factors of the pregenital organizations of the libido. Very soon there came up for discussion the influence of early masturbatory activities. These started at four or five years of age and were of the not infrequent seduction type where little boys and girls showed the usual curiosities. Thus when but five years old, in bed with a little boy one year older, who tickled her genitals and made them all hot, she recalls she got up and poured cold water over them to relieve the itching. To these were added quite early cunni linguis attacks, from a French teacher who wanted her to kiss her genitals; she was only five or six at the time. Thus were emphasized the early foundations of the intense genital itching which followed masturbatory repression at eighteen to twenty and which was related to the resultant frequently recurring, throbbing sensations and swellings in the genitals, which were a cardinal feature of the vaginal contractions of which she complained when I was first consulted. There were a number of overdetermining factors which the early dreams brought in the associated material.

Thus to quote a dream which occurred on the fifth interview:

I dreamed I was going through a long narrow passage. It was stony, like marble and carved on the sides. Away ahead there was an opening and walking towards it there were four—five, just see them, five images. A woman was standing there. She was young and thin, she had a grayish turban of fur and a muff, all covered in a misty gray, as it were. I knew it was myself and as I got nearer to her, I woke up—"With terrific palpitations of the heart."

To the practised analyst this dream shows the masturbatory features, and the associations turned up the early, French teacher; it was she, all dressed in furs, who had started the cunni linguis phantasies,

and other associations detailed the early troubled life of the father and mother, the quarrels and separation; ("her mother was not a good woman"), her life with her father, and boarding school (seven-nine) where there were other genital attacks. Also at nine-ten when in a western hotel she exhibited her genitals at the window and she was able to recall the childish delight at having the people in the street look at her. Her father's death when she was eleven, his parting messages to her—his little gifts (which she still cherishes). (A determinant for her childish transference to me.) Her life with her grandparents.

Were it not a commonplace of psychoanalytical revelation I could give in great detail the many infantile and adolescent reminiscences all bearing upon the peeping and exhibitionistic activities, and the later arriving masturbatory and still later seduction phantasies which were the determiners for much of the anxiety hysteria displacements so prominent throughout her harried life. Of these her marked selfconsciousness, timidity, docility, blushing, cardiac palpitations (so marked in her insomnia and nightmares) were evident consequences.

In her transfer situation she finally could exhibit to her heart's content without the sense of guilt and it was quite understandable how some of the annoying genital symptoms were markedly relieved within a month or two after analytical therapy.

But the nose situation still remained as persistent or more so for some time. Resistances concerning this overdetermined factor were quite evident. *"She dreamed she had a dream"* and its related repressed material was characteristic of the period which partly gave way when the more recent "nose" phobophilic determiners slowly came into prominence.

One striking incident came out after six weeks. She recalled that she was suffering from a mild diarrhea—this was just before the sanitarium period. She had used up all of the toilet paper and had recourse to a bit of newspaper. She also had a bad cold at the time and had used up all of her handkerchiefs. She wiped her nose with a piece of newspaper. Suddenly she felt that the ink had been transferred to her nose and in a terrible anxiety, with splitting headache and palpitation, she began vigorously to clean her nose from the supposedly transferred ink. On further analysis this revealed the well known displaced, anal-nasal, relationship and this started our analysis of the anal-erotic pregenital organization of the libido.

As I am not writing a *Jean Christophe* analysis of this patient, although the material is at hand, I will but briefly summarize what came out of some two years' more work. My patient could not come as often as I would have liked, they were really poor people and overconscientious and would not accept from me so much time for which they felt the recompense was trifling.

The nose symptom really was determined by the anal-erotic sadistic wish—unconscious of course—for the death of her benefactress cousin. The mass of detail regarding the economic-money-situation, the big estate, her father's flighty efforts in gold mining—the uncle trusteeship—phantasied as stealing her inheritance and its transfer to her cousin. Her envy and ambivalent love for the cousin, etc., these were long distance stations in the progressive development of the love-hate relationship to the protecting cousin.

Very briefly, she came to accept the revelations of her own unconscious, and after four years, there were about fourteen months of analysis in all, she became practically well.

At least sufficiently so as to justify me in the belief that a long chronic disabling psychoneurosis, with even psychotic developments of seven years' severe duration and a whole life time of compulsive-phobic ideation might be resolved by the psychoanalytical technic. All the more is this belief made emphatic since a large number of the socalled menopause neuroses have been so much more satisfactorily treated than by older methods employed by myself for twenty years.

And now a very brief but, to me, most interesting sequel of four hours of talk based upon a psychoanalytical background which savors of the miraculous, but be it what it may be, here are the facts known to me. There may be a multitude of others but I know only these.

Case V.—A brakeman on the Portland Oregon Railroad came into my office, why I never learned. He was fifty-six years of age. In very direct simple language he told me that for about ten years he had had every month a recurrent attack of intense depression, which lasted for three or four days. During this time he attended to his work with the greatest difficulty, invariably thought of suicide and had a host of guilty feelings.

These guilty feelings chiefly centred themselves upon three situations: his relation with prostitutes or degraded women, adolescent and manhood masturbation, and boyhood bestiality, he having attempted or accomplished intercourse with a calf in his later boyhood.

Careful anamnesis revealed that the periods of depression began approximately a month after his mother's death. He was single, she a widow for a number of years, and he had supported and lived with her some years after the father's death, due to a railroad accident. Still further anamnesis revealed that the attacks came on every twenty-eight days and lasted three or four days only, and careful inquiry and but a few fragments of unconscious material—dreams—showed that he was reliving, as a substitute for a mother attachment, *her* menstrual epochs, which lasted three or four days and had been characterized by periods of intense depression.

This mother identification, the Œdipus situation, the time period, and the unconscious situation being carefully gone into, after four talks the patient left me.

Two years later I received a letter from him saying that he thought he understood the whole business. He had not had another period of depression and was perfectly well. Whether it is all true or not I am not in a position to say. I present it as a cameo for the inspection of anyone interested.

It would of course be very gratifying if all situations might be as happily resolved as this one. It is the only one of like nature in my thirty years of experience, at least as occuring in an individual of advanced years. I have had some amusing and interesting experiences of quite striking results in

younger individuals, but this is my one banner case in an individual over fifty years of age.

Turning to the reverse side of the shield, however, I am in honor bound to state that, in general, with the aged, my failures have been greater than my successes. I could write of a number of cases in which I have felt that the psychoanalytical technic has given me no results at all in those over fifty years of age. Still while making this confession of impotency, as these are thumbed over on my record sheets, my faith in the real efficacy of the involved principles is not seriously shaken, for each and every case shows very clear indications why a real self revelation on the part of the patient could not possibly be conceived of by them as advantageous. In other words, the neurosis or psychosis was a better solution of their life difficulties than any that I, as an agent of reality, could offer.

Bergson in his delightful work on *Time and Free Will* (p. 9), has written the following:

"What makes hope such an intense pleasure is the fact that the future, which we dispose of to our liking, appears to us at the same time under a multitude of forms, equally attractive and equally possible. Even if the most coveted of these becomes realized, it will be necessary to give up the others, and we shall have lost a great deal. The idea of the future, pregnant with an infinity of possibilities, is thus more fruitful than the future itself, and this is why we find more charm in hope than in possession, in dreams than in reality."

This aspect of wish fulfilling phantasy, replacing reality, is not exclusively the field in which the aged revel—we see it often enough in youth—dementia precox for example—but when the problem arises in individual cases who have come through a fairly successful youth and who have reached adult years, and then commence to regress to phantasy formations, how far can the reality principle—as urgently insisted upon by psychoanalysis—be made applicable, based upon the experience just noted, mature judgment comes to a mixed expression. One can never tell. It is at least worth trying. Pessimism certainly closes the door—optimism, even if an illusion, is worth the effort.

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64 WEST FIFTY-SIXTH STREET.

Instructive Cases of Bile Tract Disease Considered Surgically*

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In going over my recent record of bile tract cases, I have selected six which were most instructive to me. I will briefly bring to your attention the points which seem worth reviewing.

CASE I.—Marian F., aged sixteen; entered my service in January, 1924, complaining of pain in upper abdomen with vomiting after every meal. Her earlier voluminous history had been: pain in left hip and leg, which was diagnosed as early tuberculosis of hip joint; plaster case applied, which she wore for eighteen months. Later her tonsils and adenoids were removed. During the following year she had had rheumatic pains in various places. Appendectomy in January, 1922; at this time the gallbladder was reported as negative. Six months later a low grade staphylococcus infection appeared in the lower angle of the incision, which persisted in spite of all treatment over a period of six months. When this healed she had other similar lesions over the body. During the latter part of 1923 there were several attacks of apparent cholecystitis, with no jaundice, no chill, and no fever. Upon her admission now to the hospital, the most troublesome feature was vomiting of all foods, with an occasional attack of pain over the gallbladder region. X rays showed no stones in the gallbladder, but a deformed duodenal cap and immobility of duodeneum which was probably due to adhesions to the gallbladder. On opening the peritoneum there was a mass of adhesions, binding the gastrohepatic omentum, the stomach, the duodeneum, and hepatic flexure tightly together. Carefully freeing these, the gallbladder was found almost unrecognizable, a mere cicatrix; there were no palpable stones in any of the ducts; cholecystectomy was done. Convalescence was normal and the wound healed primarily.

The patient today, ten months later, is eating and digesting her food normally, and is free from any further similar infection.

CASE II.—Mrs. M. H., aged fifty-eight years, entered the hospital on crutches, on January 5, 1921, complaining of severe pain in the back, extending down the left leg and thigh. Her earlier history showed that she had suffered more or less from rheumatic pains in several joints for the past ten years, always more persistent in the left hip. There had been occasional bilious attacks which were relieved by sodium bicarbonate and catharsis. For the past six months, she had become almost an invalid.

At the hospital the diagnosis of sacroiliac strain was made in the orthopedic service, and a cast applied. Two days later she had a severe attack of sharp, colicky pain in the right upper epigastrium

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accompanied by vomiting. This was relieved only by morphine. Temperature was 102°, and jaundice appeared in two days. Examination revealed resistance in the right epigastrium with a definite point of tenderness in the right costal arch. Diagnosis of cholecystitis was made. The cast was removed and after waiting for the acute attack to subside, which I believe is always wise, operation was performed. The gallbladder was found to be atrophied, white in color, with unusually thin walls. It was full of stones, one in cystic duct. Common and hepatic ducts were free of stones to palpation. Pancreas was somewhat enlarged. Cholecystectomy was performed. Convalescence was normal. Two weeks later the patient was moving about in bed and suffered little or no discomfort from her left hip. At the end of the third week she was up, out of bed, and bearing her weight upon her leg, without pain. March 1st, the patient was discharged, without her crutches. The result was spectacular.

I have been able to keep in touch with this patient and she has remained perfectly well ever since.

COMMENT

There is nothing unusual in these cases, but they emphasize so splendidly the gallbladder as a site of focalization. The teeth and tonsils are now commonly thought of and with these sites ruled out, the appendix probably is the next organ for consideration, with the gallbladder last. When the gallbladder is once infected, it seems to have little resistance in the future, and easily becomes the nest for bacteria. In both these cases, the gallbladder had been diseased evidently for a long time. In Case I, the gallbladder was not alone a hopelessly diseased organ, but by its inflammation, had created a dilated duodeneum, which could not possibly functionate properly. This patient had had her appendix removed two years previously, at which time the gallbladder was reported negative. Personally, I am inclined to believe that even then, the gallbladder was diseased and passed unrecognized. (I did this appendectomy.) To diagnose a diseased gallbladder in the earliest stages of its disease is of great importance. I believe we must do more than feel for stones, or for adhesions, or test the patency of its duct. We must examine its color, its mural thickness, and especially as Sir Berkeley Moynihan teaches us, look for that subserous deposit of fat found usually near its pelvis, or near the cystic duct, which is the first visible sign from the exterior of an infection of the walls of the gallbladder from within. Such cases as these prove conclusively that we must routinely make earlier diagnosis of our sites of focalization, before destruction of healthy tissue, with months of suffering for the patient.

Case III.—Mr. C. W., aged fifty-one years, seemed to present a case of typical chronic cholecystitis. His dyspeptic symptoms, bizarre in character, his chronic rheumatic features and the pain and tenderness located over the gallbladder region with some muscular resistance, are all typical.

November 9, 1923, at 3:00 a. m., I was called to his home. He had just walked up the stairs to the fourth floor when he was taken with the most severe pain, stabbing in character, located behind the sternum. There was no radiation except to the back. This apparently had been precipitated by the effort of climbing the stairs. He was in shock; face pale and cyanotic, and bathed in cold perspiration; respiration shallow, pulse thready, facies of extreme suffering. He could not lie quietly, but was tossing about the bed. There was still no evidence of cardiac disease. The abdomen was decidedly rigid, and whether this rigidity was due to muscular effort in attempting to relieve the spasm, or to some intraabdominal catastrophe, I could not make out. The extreme restlessness was typical of colic instead of a rupture of a viscera, in which condition the patient lies absolutely motionless, with no attempt to move. I was most anxious, fearing that I had allowed this man to go too long without surgical aid. Several hours later the tale was told. The heart, fatigued, began to dilate. The abdominal spasm lessened. The blood pressure fell, and now the abdomen showed no rigidity, no spasm, no distention. The patient died in the hospital twenty-three days later.

I regret that there was no autopsy obtainable, and that we do not know more accurately whether there was an existing cholecystitis, but the case certainly served as a great lesson in differential diagnosis. Of interest in conjunction with this case is the report from the Mayo clinic of eighty-six autopsies, in which coronary sclerosis was found with a complicating diseased gallbladder in twenty-four per cent.

Case IV.—The next case was that of Mrs. W., aged sixty-one, a farmer's wife, mother of four children. For years she had had gastric disturbances, and had to refrain from eating many articles of food on account of distress and vomiting. For past five months, these attacks had been more frequent, the pain always in right upper epigastrium with no radiation. A moderate degree of jaundice would follow these attacks after two or three days.

Physical examination was practically negative, except for a point of tenderness over the gallbladder region. There was no urinary sugar or blood sugar present. X ray showed no shadows suspicious of stones, but duodenum had limited mobility, probably due to adhesions.

At operation the gallbladder was found atrophied and bound down fast to liver, full of small, putty-like stones, one in cystic duct, easily dislodged. Common and hepatic ducts, not obstructed, as far as palpation could determine. Both pancreas and liver enlarged; appendix kinked and adhered to cecum. Cholecystectomy and appendectomy constituted the operative procedure.

The patient was out of bed in fourteen days, having had a normal convalescence. The next day, however, the patient suddenly complained of very sharp, colicky pains in the epigastric region, extending over across to the left side. Six hours later she vomited and the dressing was found saturated with a yellowish green bile which appeared from the sinus where the tube had originally been inserted; the pain being almost instantly relieved. Forty-eight hours later there was another, similar attack of pain, which was relieved, following a profuse biliary discharge. During the next week there was general improvement in the patient's physical condition, and patient was discharged at her own request, although plainly told that she must expect more trouble.

Ten days later she was readmitted to the hospital

in profound shock and collapse; had been vomiting almost continuously for the past three days. The abdomen was distended, and generally tender in the upper portion; pulse 140, respirations 36. No operative measures could be thought of in her present condition. Shock measures were ordered. Urinary sugar was present, and blood sugar, 212 milligrams. The patient was given small doses of insulin, with glucose. In twenty-four hours, the blood sugar was 192 milligrams; and the stomach began to quiet down; her mental condition appeared better; bowels moved well, and biliary drainage lessened. A few days later there was no discharge, and soon the sinus closed entirely. Within three weeks the patient was discharged in good condition, with still a slight increase of blood sugar, however. Today, the patient is well and is doing her regular household work.

It does seem as if insulin did just take us over a critical period and help to establish the patient's carbohydrate tolerance, and should always be considered in cases of pancreatitis.

COMMENT

I am not satisfied to dismiss this interesting case without a little reflection upon what was the probable cause of this stormy postoperative convalescence. I believe all of us see quite frequently during the early stages, attacks of mild colic, which we are likely to attribute to errors in diet, but which Charles H. Mayo tells us are probably the passage of mucus and sloughs, the last signs of an abating infection in the hepatic and pancreatic tissues. This was certainly more severe than one of these attacks; it was an intermittent biliary colic—the sudden rapid dilatation of a duct with its acute pain. Was it calculous or noncalculous, and if calculous, was the stone in the common or hepatic duct, and if noncalculous, was it due to an injury of the common duct at operation, or to a most severe inflammatory process in the pancreas or liver? Such was my quandary. The obstruction has now spontaneously cleared up.

In an article by Judd and Bruden, of the Mayo Clinic, I was especially interested in the finding at the second operation of twenty-four cases of intermittent biliary colic following cholecystectomy. In these cases there was no stone in the common or hepatic ducts; the most important and common lesion was chronic pancreatitis; not the hard interstitial type, nor the malignant type, but a chronic inflammatory type of infection of both liver and pancreas.

CASE V.—M. S., aged fifty-two years, a laborer, a moderate drinker, entered my service at the hospital January 14, 1922. He had always been well until a year ago, when he first began having indigestion off and on, with distress and fullness after eating. Of late he had felt weak, and unable to do his work, and had lost his appetite. One month ago, for the first time, he noticed jaundice which was now getting deeper and deeper until he was almost of a green color. There was little or no pain although tenderness in right upper quadrant.

The patient was of fair nutrition; his entire body was deeply jaundiced, with sclera deep green. Everything negative except a small mass the size of an orange, above the umbilicus. This mass was dull to percussion; and not tender to palpation. The liver was enlarged. Gastrointestinal series negative; x ray showed no shadows to interpret as gallstones. Urine examination revealed bile plus 4 with trace of albumin; Wassermann negative, bleeding time five minutes. Preliminary diagnosis, probably malignancy of pancreas. A blood transfusion was given the day before operation, with improvement in bleeding time.

Upon opening the peritoneum the gallbladder was found distended—much elongated with walls thin, containing no stones. The ducts showed no obstruction to palpation. The head of the pancreas was enlarged, hard and nodular. There were also some palpable lymphatic glands along the ducts. I felt we were dealing with malignancy. As regards the surgical procedure, certainly there must be biliary drainage, and this probably for a long continued time, if the patient lived. A cholecystoduodenostomy seemed to be the procedure of choice, as the cystic duct was free and gallbladder not badly diseased.

For the first few days the patient did well. He had no vomiting, no distention and no signs of tenderness. On the fifth day the intern's attention was called to some oozing on the dressing. This was the start. There was more oozing at the site of incision, subcutaneous hemorrhages elsewhere, and hematuria and hematemesis. Temperature went to 103° and then to 106° just previous to death.

COMMENT

In this case, it is probable that the bile did not start to flow but remained obstructed, and that the bile in the blood caused the capillary bleeding and finally the renal insufficiency, with death. The bleeding time had been reduced to four minutes and we thought we were safe in attempting operation. The case shows how important it is, that whatever the obstruction to the biliary flow may be, it must be very shortly relieved after operation and reestablished, or hemorrhage and death will surely follow.

CASE VI.—Mrs. S., aged fifty-two, had consulted me a number of times. Her complaint was chiefly indigestion with gas and belching; nausea and vomiting. These attacks began nine years ago; would occur at irregular intervals and confine her to the house for two or three days. She had never been pregnant. Early in life she had had typhoid fever and had suffered much from toxic rheumatic pains in various areas. In December, 1921, the patient suffered one of these attacks, more severe than its predecessors.

Vomiting was almost continuous and in four days was followed by jaundice, which increased in severity to a lemon yellow tint. The patient was losing strength and weight (twenty pounds) and showing signs of prostration. Physically, everything was negative, except some resistance and tenderness upon deep palpation over the gallbladder region. Clinically, urine showed bile plus 4; otherwise negative; coagulation time, ten minutes; Wassermann negative, (although as we know, a jaundiced blood often gives a positive Wassermann) test meal, negative; x ray, no shadows of stones, or any alteration in duodenal cap. Patient was not in bad condition but was given the usual preoperative treatment for

jaundice; not a transfusion, however. Tentative diagnosis, chronic pancreatitis with a possible malignancy.

At operation the gallbladder was found enlarged, with thin walls adherent to the duodenum and gastrohepatic omentum; pancreas was enlarged and hard; no duct stones palpable. It seemed to be an ideal case for cholecystoduodenostomy, as I wasn't positive of the pathology and yet there was need of biliary drainage. The after results were excellent; nausea and vomiting were present for a week in a moderate degree, but gradually the stomach irritation subsided; food was taken with relish and digested. In two weeks the jaundice was noticeably clearing up. Mrs. S. left the hospital a little over a month from her admittance. I have seen her several times during the intervening period (thirty-two months) but not professionally except once. She has never been better physically and is truly a happy and well satisfied expatient. The end results were good and in marked contrast to the previous case.

COMMENT

Both patients were of the same type. Both were past middle life, and presented a steady loss of weight and strength; both had enlarged liver and pancreas. Out of a clear sky appeared the jaundice; the slowly progressive jaundice without pain, so suggestive of malignancy. Sir Berkeley Moynihan says "Pancreatitis mimics both carcinoma and calculous forms of common duct obstruction, and no one living is infallible in the differential diagnosis. Therefore, operate as a guess is a poor peg upon which to hang a man's life!" Some short circuiting operation seems to be the method of choice. Its indications are, first, when the gallbladder is of any size and free, it is easy and can be done with little manipulation; second, when there is any doubt or question of pathology, as so often happens; third, when one cannot easily remove the duct stone; fourth, when one is dealing with malignancy, whether of the pancreas or of the liver, this procedure is the way out of the difficulty with ease and apparent safety. Of course such an operation cannot be done when the gallbladder is atrophied or when it is gangrenous or malignant, or the cystic duct obstructed.

All these obstructive jaundice cases need drainage over a long time, if not indefinitely, and how much happier the patient is, if the wound is neatly healed with no dirty, uncomfortable sinus, conveying bile to the outside, but in its place, there remains biliary drainage on the inside, going on continuously, bathing and healing any duodenal ulcerations that may exist. And if malignancy is present, the man is certainly far happier in his last days, and the bile salts are not lost to the body.

In considering these cases of icterus, quite recently DeTakats has taught us some helpful facts. Icterus is of two kinds; first, the complete icterus, which he calls cholemia, a condition where all the constituents of the bile are circulating in the blood stream (the pigment the bile acids and cholesterin). This is a serious condition and means a diseased and impaired liver function with its bad prognosis. The second kind of icterus is the partial type or bilirubinaemia, a condition where only bilirubin circulates in the blood. This is a harmless pigment and indicates a far more favorable prognosis. Blood analysis for the bilirubin index is therefore of great diagnostic help. It appears in the blood long before it is visible either in the tissues or in the urine, and so may help explain certain colics of unknown origin. While in all jaundice cases due to bile tract disease, if we know whether we are dealing with a cholemia or a bilirubinemia, we can be guided not only in our preoperative preparation but in our choice of anesthetics, and in our operative procedures. De Takats also stresses the application of Duke's test for the surgeon, because if the bleeding time is normal (two to two and one half minutes) we need not consider the coagulation time, as every toxic agent that prolongs coagulation time also effects bleeding time.

TREATMENT

The present accepted treatment in preoperative preparation for these cases is, first, intravenous solution of calcium chloride (three injections of five c.c. of a ten per cent. solution in redistilled water). Second, glucose intravenously and by hypodermoclysis; third, blood transfusion, and fourth, postponement of operation when jaundice is increasing, or bleeding time increased.

The postoperative treatment which is so important, I wish only to mention. Glucose is the most useful drug in all cases of liver incompetency; it supplies the liver with its needed glycogen, it combats acidosis, and is the very best nutrition for the heart. I use it in nutritive retaining enemas with soda, repeating every four or six hours. Proctolysis I have practically given up, partly because I believe that but a very small percentage of the solution ever reaches the circulatory system, and partly because the patient almost invariably objects after a few hours. Glucose, too, should be the drug for hypodermoclysis instead of saline and also for intravenous infusion.

Just recently there has appeared a method of satisfactorily giving a continuous intravenous drip, where an electrical coil with a connecting thermostat allows us to keep the solution both in the container and in the tubing at a regulated temperature. This seems most practical.

Hot packs over the liver, to help maintain internal respiration as suggested by Crile, should not be forgotten. Gastric lavage carried out early and often repeated is a necessity. A mistake very apt to be made is to postpone this treatment for too long a period, merely out of sympathy for the patient.

SUMMARY

1. Routinely consider the gallbladder and make an earlier diagnosis of cholecystitis, before the damaged tissue has become extensive and the patient has had months of impaired health, for the gallbladder is a site of infectious focalization far more often than we have realized.

2. Hepatitis and pancreatitis exist in most cases of chronic cholecystitis as an accompanying infection. They may clear up after a cholecystectomy or cholecystostomy but they may persist and cause intermittent biliary colic, post operatively, instead of a common duct stone, as is usually diagnosed.

3. Coronary thrombosis may assimilate a bile tract infection or exist in conjunction with it.

4. Blood analysis for the bilirubin index and the constituents of the bile is of great help in making early diagnosis—as well as in determining the operative procedure and prognosis.

5. The preoperative preparation of patients with obstructive jaundice, chiefly by blood transfusion, by calcium chloride solution intravenously, and by delay in operation until blood chemistry and venous bleeding time show an improvement is of great importance toward a successful operation.

6. Approach the operative procedure with a free mind and in applying treatment always consider the primary course.

7. There are many advantages in the operation of cholecystoenterostomy, if it be possible of performance.

8. The reestablishment of biliary flow very shortly after operation must be secured; otherwise tissue oozing, toxic nephritis with death will follow.

9. Use of insulin may tide us over a critical period and help establish the patient's carbohydrate tolerance, especially in the presence of pancreatitis.

10. Glucose is one of the most useful drugs in all cases with liver incompetency.

A complete bibliography will appear in the author's reprints.

The Value of Blood Transfusion in Subacute and Chronic Infections*

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The more we delve into the speculations and thoughts of ancient man, the more strikingly are we forced to the conclusion, that basic conceptions and ideas regarding natural phenomena are as old as the power of reason and observation itself. The imagination of the ancients was fired by the conviction that the blood was essential for the life and well-being of all forms of animals, and consequently they attributed to it spiritual qualities. Thus, we find that in the crude ancient civilizations of Egypt, the value of blood transfusion as a therapeutic measure was known, and records show that it was practised.

Viewed in the light of the present day development of microscopy and our knowledge of hematology and seroimmunology we know that their vague thoughts regarding the value of blood transfusion as a therapeutic agent were not ill conceived. As we trace the alternating popularity and stormy vicissitudes which the procedure of blood transfusion experiences, from the first recorded blood transfusion at the end of the fifteenth century to a comparatively recent time, we cannot help but admire the indomitable will and unfailing courage of medical thinkers of the past, who had not only mechanical difficulties to overcome in transplanting the blood from donor to recipient, but also frequently encountered mysterious dangers, little understood, which sometimes caused posttransfusion reactions that were fatal.

MODERN METHODS OF BLOOD TRANSFUSION

That the transfusion of whole, unmodified blood is superior in value to blood adulterated by an anticoagulant is a matter of common knowledge which was established by the investigations of Novy and De Kruif (1), Drinker and Brittingham (2) and Clowes (3). The latter has pointed out, in a series of experiments, the similarity between sodium citrate and sodium chloride as to their general toxic effect upon protoplasm. The late Dr. Edward Lindeman, in a report of 214 transfusions without a chill, accounted for that remarkable result by his use of pure unmodified blood, introducing no foreign material, not even physiological salt solution, into the blood of his patients.

The syringe method, without any doubt, is the greatest advance that has thus far been made in surmounting the mechanical difficulties encountered in transplanting blood. It was with a desire to simplify the transplantation of blood so that with comparatively little skill it could be universally employed by the average physician, and in order also to eliminate the use of saline or other foreign material, that I began about six years ago, to experiment with various valves and combinations of syringes that would fill that requirement. An apparatus was perfected which was presented before the surgical section of the New York Academy of Medicine in 1920 and a description of which has been published (4). The apparatus provides an uninterrupted flow of blood from donor to recipient, requires only one man to operate it, and reduces the length of time necessary for a transfusion, two syringes being in action instead of one. No saline solution is necessary to prevent clotting, as there is no stagnation of blood during the course of the operation, the flow of blood from donor to recipient being practically continuous. The apparatus, being a one man affair, enables one to use it in his office or patient's home without any assistant and with comparative ease.

BLOOD TRANSFUSION IN INFLUENZA PNEUMONIA

That blood transfusion in frequently repeated doses of five hundred c.c. every twelve to twenty-four hours, from actively or passively immunized donors is of value in desperate pneumonias complicating influenza is brought out in a report by Ross and Hund (5). In these advanced cases they found the coagulability of the blood markedly diminished, and by the introduction of normal blood platelets by means of blood transfusions, the coagulating power of the blood was restored to normal.

Using patients recently convalescing from pneumonia, that is, those convalescing from two days to six weeks from pneumonia, when the immune content of their blood is at its height, they report the following remarkable results from frequently re-

*From the Surgical Service of Dr. Charles Gordon Heyd, New York Postgraduate Medical School and Hospital. Read before the Bronx County Medical Society, October 15, 1924.

peated blood transfusions: "A definite localization of the pneumonic process with progressively increasing leucocytosis and resolution, rapid clearing of the cerebrospinal, respiratory, cardiovascular and renal disturbances, diminished acidosis and normal temperature for from twenty-four to seventy-six hours following the transfusion."

From a study of a series of fifteen cases, three of which I shall cite below, I am forced to the conclusion that blood transfusion has a remarkably beneficial effect upon a patient generally and upon a suppurating wound locally. Its action may be explained as follows: First, its stimulating effect upon the hematopoietic system: the transplantation into the circulation of healthy red blood cells and compliment, causes a stimulation of the function of the opsonins and the phagocytic power of the white blood cells, thus materially awakening the dormant powers of the patient to combat the infection. Second, its effect in overcoming various grades of anemia dependent upon subacute or chronic sepsis. Third, the effect of blood transfusion in staying or counteracting various degrees of emaciation and partial marasmus and in increasing the resisting powers, physical, chemical and immunological, of the patient. That blood transfusion saved at least one patient's life is quite apparent from the following observations:

Case I.—Patient, H. B., male, aged fifty-three, foreman, admitted to the service of Dr. Charles Gordon Heyd, at the New York Postgraduate Medical School and Hospital, April 9, 1924. The family and previous histories were irrelevant.

While working in a factory, he bumped his left elbow against a machine. Four days afterward there developed what appeared to be a boil, which gradually grew in size and extent until his entire left arm and forearm became markedly swollen, red and inflamed.

Examination upon admission revealed an infected left olecranon bursa and cellulitis of the left arm and forearm. His temperature on admission was 104, pulse 128, respiration 28. His blood count was 10,000, eighty-six per cent. polymorphonuclears, ten per cent. small lymphocytes, one large lymphocyte, one eosinophile and two transitionals.

Four days after admission there developed a diffuse cellulitis of the left arm, forearm and hand and streptococcus hemolyticus was isolated from the wound. He was then operated upon, multiple incisions being made and suitable drainage established.

On April 26th, streptococcus hemolyticus was isolated from the blood. His temperature and pulse since admission ranged between 100° and 105° and 100 and 130, respectively. On May 7th he was given a transfusion of 500 c.c. of whole blood. His blood count on May 9th was 22,000, polymorphonuclears eighty per cent., lymphocytes thirteen per cent., transitionals five per cent., mononuclear leucocytes one, basophiles one.

Following the transfusion, there was a remarkable improvement in the patient's general condition and quite an apparent improvement in the wound, with a gradual recession of the temperature. Four days after the transfusion the temperature and pulse were 99° and 104° respectively. Thereafter until his discharge the temperature ranged between 99° and 100° and the pulse between 90 and 110. On May 24th, he was discharged convalescing and the wound healing.

Case II.—D. A., male, aged two and one half, years, admitted to the Post-Graduate Hospital September 11, 1923. The family and previous histories were irrelevant.

Two months prior to admission there developed in the patient an abscess of the neck which was opened by the family physician. Three weeks later the patient began to suffer from a cough and fever, the family physician, making a diagnosis of pneumonia, advised admission to the Postgraduate Hospital.

Upon admission the patient had a temperature of 98.6°, pulse 162 and respirations 46. Physical examination revealed all the cardinal signs and symptoms of the following conditions: 1. Pleural effusion, right side, 2, bronchopneumonia, 3, pneumothorax due to thoracentesis, and, 4, diseased tonsils and adenoids.

He showed all the signs and symptoms of a toxemia and bacteremia, with an apparently poor response to the infection.

His temperature from the day of his admission to September 22nd ranged between 99° and 102°, pulse 100 to 160 and respirations 30 to 48. On that day he was given a transfusion of 80 c.c. of whole blood. On the following day his temperature, pulse and respiration fluctuated between 99° and 100°, 100 and 120 and 26 to 36 respectively, until September 29th, when a resection of a rib was performed, which caused his temperature to rise to 103.5°, pulse 160 and respirations 60. Thereafter the condition ran a characteristically septic course, the temperature, pulse and respiration fluctuating daily between 99° and 104°, 130 to 164 and 36 to 50 respectively. On October 13th, another transfusion of one hundred c.c. of whole blood was given. Following the transfusion the temperature gradually receded. On October 21st, his temperature reached 99°, pulse 136 and respirations 22, with a marked improvement in his general condition. Thereafter his recovery was progressive and uneventful and he was discharged convalescing, November 7, 1923.

Case III.—L. H., female, aged twenty-three, housewife, married one year. The family and previous histories were irrelevant.

Two weeks prior to my being called upon to give her a transfusion, she was delivered of a normal, mature nine pound boy. Seventy-two hours afterward a slight fever developed, and she complained of headache, general malais and pain in the back. At about the same time her attending obstetrician noticed a foul smelling, purulent, vaginal discharge, which resisted the usual forms of treatment. Since then she had a typically septic temperature, pulse and respiration which fluctuated daily between 100° and 104°, 110 to 130 and 24 to 30 respectively.

Her blood picture just prior to transfusion was as follows: Red blood cells 3,100,000, hemoglobin by Sahli method 52 per cent., white blood cells 18,000, polymorphonuclears eighty-two per cent., small

lymphocytes fourteen per cent., large lymphocytes three per cent., and eosinophiles one per cent.

I gave her a transfusion of one thousand c.c., the husband acting as donor. Twenty-four hours after the transfusion her temperature dropped to 100°, pulse 106 and respirations 26. There was an apparent and striking improvement in the general condition of the patient, who became cheerful, took a greater interest in her environment and asked for nourishment. The vaginal discharge was diminished in quantity and altered in quality. Forty-eight hours after the transfusion, her temperature was 99°, pulse 100 and respirations 26. Her blood picture was as follows: Red blood cells 4,100,000, hemoglobin seventy-six per cent., white blood cells 14,600, polymorphonuclears seventy-six per cent., small lymphocytes sixteen per cent., large lymphocytes six per cent., eosinophiles one per cent., and basophiles one per cent.

The patient thereafter continued progressively to improve and made an uneventful recovery.

CONCLUSIONS

1. Whole blood, because of its nutritive and bactericidal properties, is an unexcelled stimulant.
2. Blood transfusion is of unquestionable value in combating infection, toxemia and bacteremia and in overcoming anemia. It should not be used as a last resort but as a therapeutic procedure.
3. No patient whose response to infection is below normal should be allowed to struggle on against that infection without the stimulation of a blood transfusion.

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Report of a Method of Resuscitation in Asphyxia Neonatorum

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A method of resuscitation of the newborn consisting in the insufflation of the vapors of aromatic spirits of ammonia, was first improvised and used successfully by me in a case of asphyxia pallida neonatorum, which resisted all efforts at resuscitation by the standard methods. This case occurred in my practice on July 4, 1923, and is the only one in which I had occasion to give the method a fair trial. I have since communicated the method to other physicians who have reported successful results in all cases in which it was tried, including only such cases in which resuscitation by other means failed. Beside the original case, five cases are reported by Dr. Lawrence Gilman from the service of the Indianapolis City Hospital, one case by Dr. L. H. Stafford, St. Francis Hospital, and one case by Dr. W. F. Johnson, Methodist Hospital. Dr. Johnson also used the method successfully in three additional cases of lesser severity, which are not reported. The total report of eight cases, though representing a comparatively limited experience, is at the same time remarkable for the strikingly uniform results obtained in such severe cases, as well as for the absence of failures. It is to be noted that in five of the eight cases reported mouth to mouth insufflation without ammonia was first tried as a control, without success.

METHOD

On a piece of gauze wrung out of warm water, put three or four drops of aromatic spirits of ammonia, the gauze placed over the mouth of infant, mouth to mouth insufflation is practised at the rate of about thirty a minute, being careful not to overdistend the infant's lungs, and assisting expiration by slight pressure over the chest. More ammonia is added as insufflation proceeds, using three or four drops at a time only.

In looking over the literature for the past fifteen years, no mention could be found of the use of ammonia by insufflation in the treatment of asphyxia neonatorum. The only references to the use of ammonia in the treatment of asphyxia of the newborn were found in a series of articles in the New York Medical Journal for 1909, in answer to the prize question: How Do You Treat Asphyxia Neonatorum? Dr. Sara E. Foulks (1) wrote: "A few drops of aromatic spirits of ammonia upon a piece of absorbent cotton may irritate the nasal mucous membrane to such an extent that respiration not only begins, but movements of the whole body are reflexly instituted." Dr. C. L. Sigler (2) said: "If there is any effort at all at respiration, inhalation of stimulants as aromatic spirits of ammonia or camphor may be tried." Dr. Joseph Baum (3) wrote: "In extreme cases the inhalation of strong ammonia and the hypodermic injection of strychnine sulphate one one hundred and fiftieth grain are of great use."

As is well known, the empirical use of aromatic spirits of ammonia as a heart and respiratory stimulant in emergencies is quite general, but there is still some dispute as to the mode of action of inhaled ammonia vapors. Poulsson (4) states: Inhalation of dilute ammonia produces by reflex from the nasal mucous membrane to the medulla, vasoconstriction and heightened blood pressure, cessation of respiratory movements for a moment, and then deeper respiration. Cushny (5) quotes: The epithelium of the lungs has been stated to be impermeable to the ammonium ion, but this appears to be incorrect. (McQuigan) (6). In discussing the action of inhaled ammonia, Cushny further states: When inhaled, the irritation of the mucous membrane causes a reflex stimulation of the vasomotor centre, and consequent contraction of the arterioles

and augmented blood pressure, while the respiration is first arrested, and then becomes deeper and fuller. The heart may be temporarily slowed by inhibitory reflexes. Hare (7) states: The injection of ammonia in moderate quantities into the blood, causes an acceleration of the rate of respiration due to stimulation of the respiratory centre, the respiratory movements becoming not only more full, but also more rapid. If the drug is inhaled in small amounts or swallowed, the same action is seen in a less degree, the changes both in breathing and in circulation being partly due under such circumstances to a reflex irritation transmitted along the sensory nerves.

My conception of the therapeutic effects obtained from insufflation of the vapors of aromatic spirits of ammonia in asphyxia neonatorum is as follows: The collapsed lungs are distended, the alveolar capillaries fill up, thus reducing the pressure in the right heart and helping in the closure of the foramen ovale. The insufflated ammonia vapors stimulate the mechanism which normally initiates respiration, the establishment of which is naturally and to a great extent dependent on reflex stimulation of the cord and vasomotor centre from the body surfaces. Reflex stimulation of the cord initiates contraction of the muscles of respiration, reflex stimulation of the vasomotor centre promotes a proper distribution of blood to the vital centres in the medulla as well as to the body in general. It is evident that the vasomotor centre is the main focus of disturbance in asphyxia neonatorum, since both forms of asphyxia, namely, pallida and livida, represent phenomena referable to vasomotor function. In addition to this reflex effect, some ammonia at least penetrates the alveolar epithelium and produces the direct stimulating effects characteristic of injection of ammonia into the blood. The method is ideal because it combines the effects of physical distention of the lungs, reflex on medulla and cord, action of respired air containing an excess of carbon dioxide, and the stimulating ammonia vapors.

Case I.—Infant C. B. S., weight nine pounds, born at home, July 4, 1923, 5 a. m.; normal labor lasting five hours. Maternal medication; morphine sulphate one sixth gr. hypodermically about three hours before delivery; pituitrin one half c.c. fifteen minutes before delivery. Position L.O.A., cord normal. No signs of respiration or cry; pallor, relaxed state. Heart beats feeble, about 140 a minute. Resuscitation began by clearing the mouth and throat, holding infant by the legs, slapping its back and using cold spray. When it was apparent that no results would follow, the cord was cut and tied, artificial respiration performed by Sylvester method, and heat applied. A few minutes of this without the slightest results, and mouth to mouth insufflation was tried for several minutes with no result. By this time, the heart beats had slowed down to the alarming rate of thirty a minute. The next thing tried was an injection of three drops of aromatic spirits of ammonia, when the feasibility of insufflating ammonia vapors presented itself. On a piece of gauze wrung out of warm water were put two drops of aromatic spirits of ammonia, the gauze placed next to the mouth of the infant, and mouth to mouth insufflation was practised at the rate of about thirty a minute, care being taken not to overdistend the infant's lungs. Expiration was assisted by slight pressure over the chest. After about six insufflations the infant produced a spontaneous respiration. Insufflation was practised a few more times, and shortly normal respiration was established. No ill effects followed and the infant was healthy when seen last, two weeks later.

The following five cases are reported by Dr. Lawrence Gilman from the Indianapolis City Hospital:

Case II.—Patient H. W., primipara, admitted 4.50 p. m., March 15, 1924. In labor thirty-six hours, forceps delivery, ether anesthetic. Infant born 8.50 p. m., pallid, refused to breathe spontaneously. The following methods of resuscitation were attempted in the order given: spanking, dipping in cold and warm water alternately, irritation of soles of feet, warm bath, artificial respiration, mouth to mouth insufflation, with no results. Then insufflation of aromatic spirits of ammonia was instituted. Three to four drops of the ammonia spirits were placed on a moist square of gauze, interposed between mouth of infant and accoucheur, and mouth to mouth insufflation carried on. The child breathed after a short period of insufflation (ten to twenty seconds) and continued. Breathing began gradually and without gasping. Infant gained weight normally and left the hospital with its mother, March 24, 1924.

Case III.—Patient, N. B., primipara, admitted 1 p. m. February 4, 1924, breech presentation. Twilight sleep and ether. Labor lasted twenty-eight hours. Delivered of female child at 7.40 a. m. February 5, 1924. Infant blue; did not breathe spontaneously from 7.40 a. m. to 8.15 a. m. The following methods of resuscitation were tried: spanking, irritation of soles of feet, hot bath, artificial respiration, dipping in warm and cold water alternately, folding, mouth to mouth insufflation, all failed. At 8.15 a. m. three or four drops of aromatic spirits of ammonia were placed on gauze over the patient's mouth, and mouth to mouth insufflation instituted. After about fifteen seconds of insufflation of the fumes, the child cried and began automatic respiration. The child continued to breathe until about midnight when last observed, but was found dead in its crib at 12.30 a. m. by the nurse. No autopsy was allowed.

Case IV.—Patient B. H., primipara, admitted 7.30 a. m. March 8, 1924, twilight sleep. Delivered of nine pound male infant, March 8, 1924, 2 p. m. Infant blue and refused to breathe after the usual means of resuscitation were employed, including mouth to mouth insufflation. Then insufflation of aromatic spirits of ammonia was resorted to and infant breathed in less than twenty seconds after the institution of the above procedure and continued. Left hospital March 17, 1924, with mother.

Case V.—Patient M. B., primipara, admitted 11.50 p. m., March 10, 1924. Delivered of eight pound infant at 7.10 p. m., March 11, 1924. Infant pallid, refused to breathe. Usual means of resuscitation failed. Infant resuscitated by insufflation of aromatic spirits of ammonia. Child was normal, lost one pound six ounces in weight, but gained back fifteen ounces before discharge with mother, March 21, 1924.

Case VI.—Patient F. B., primipara, admitted 3 a. m., March 15, 1924. In labor forty-eight hours.

Infant pallid, did not breathe. Resuscitation by insufflation of aromatic spirits of ammonia after the usual methods of resuscitation failed. Child was normal and left hospital with mother, March 24, 1924.

Dr. L. H. Stafford's case, St. Francis Hospital:

Case VII.—Patient M. M., primipara. Admitted August 19, 1923. Patient in labor twelve hours. Caesarean section done, August 20th, 1.40 p. m. Infant pallid, refused to breathe. Usual methods of resuscitation including heat, artificial respiration failed. Infant responded immediately after insufflation of aromatic spirits of ammonia was instituted. Patient in good condition, discharged August 30, 1923.

Dr. W. F. Johnson's case, Methodist Hospital.

Case VIII.—Patient M. N., boy, ten pounds, born July 14, 1924. Ether anesthetic. Labor lasted twelve hours. Bones of head firm and fontanelles small. After delivery of head, it was fifteen minutes before shoulders could be delivered, giving the placenta time to dislodge. After delivery, cord was white with no pulsation. Infant pallid and apparently dead. Unable to get any sign of heart beat or breathing, no eye reaction. The usual methods of resuscitation were tried, including artificial respiration, application of heat and mouth to mouth insufflation with no results. The infant seemed dead and the interne and head nurse also thought it was dead. Then insufflation of ammonia was tried. Three drops of aromatic spirits of ammonia were placed on a cloth and blown into the child's mouth, getting a slight quiver. More ammonia was added about every minute, forcing respiration regularly. In about ten minutes there were signs of heart action but no natural breathing. Insufflation of ammonia was continued for about a half hour before the infant would breathe of its own accord. Then oxygen was used for about six hours. The baby lives and is growing finely. No ill effects followed the prolonged insufflation of ammonia. The infant was kept in the incubator for twenty-four hours.

CONCLUSIONS

The method could be modified so that in hospitals, where special apparatus is available, the ammonia vapors may be insufflated with their aid. In severe cases, it is advisable to inject two to five minims of aromatic spirits of ammonia hypodermically, in addition to insufflation, in order to gain continuous stimulation. Care should be taken in not using too much ammonia at one time, for a too high concentration of the vapors may produce bronchitis or pneumonia (8). This may be avoided by using only three or four drops at a time. The last case reported emphasizes the possibility of resuscitating apparently dead infants whose circulation is practically at a standstill. The important factor is that reflex action may still be elicited when all other vital phenomena have apparently disappeared and in such cases of suspended animation, effective stimulation may be obtained by the above means.

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The Surgical Treatment of Abscess of the Lung*

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We assume that the patient has received all the possible aids to diagnosis and that the area of pulmonary suppuration has been located as accurately as possible by means of stereoscopic x ray films, the bronchoscope, if necessary, and a careful physical examination. If a foreign body was the exciting cause it has been removed, if possible, by the use of bronchoscopic forceps. Postural drainage, fresh air, and forced feeding have all been employed, but at last we are forced to the conclusion that more radical measures must be used.

What further resources have we to summon to our aid?

1. Bronchoscopic treatment: dilatation of a strictured bronchus or lavage; 2, pneumothorax; 3, drainage of the abscess from the exterior; 4, extrapleural thoracoplasty, and, 5, lobectomy by either the original methods or, preferably, by the actual cautery destruction. Before discussing these in detail we must briefly consider a few important facts.

It is of the utmost value to determine: 1. Is the abscess single and well encapsulated? 2. Is there a diffuse area of pulmonary involvement with multiple abscess points like a honeycomb occupying a considerable portion of a lobe? 3. Is it chiefly a bronchiectatic dilatation? 4. Is it centrally located, or, is it peripheral? 5. Are pleural adhesions present?

Let us now take up the methods of treatment at greater length. Bronchoscopic treatment has been used in a number of cases. The late Dr. Lynah was one of the pioneers in this work. No one can question its value for the removal of foreign bodies or to make drainage more free in centrally located abscesses, or to determine whether the pus comes from the middle or lower lobe.

On theoretical grounds I am inclined to agree with Chevalier Jackson when he says: "In no case of lung abscess whatever should bronchoscopy be used for

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treatment and thoracotomy delayed." Further experience may alter this dictum.

Lambert and Miller say "Bronchoscopic lavage, which was used in only three cases, gave indifferent results." I, myself, have seen one or two failures of this kind.

Pneumothorax is indicated only in central abscess when operation would be dangerous or impossible. Essential requirements for this are the absence of pleural adhesions and the presence of free bronchial drainage. Tewksbury has reported fourteen cases thus treated with eleven cures and two deaths. Lambert and Miller say "It was used very little. In peripheral abscesses its use is dangerous because of the risk of rupture of the lung and secondary pyopneumothorax . . ." Hedblom says "The results are disappointing. Cases must be recent ones. The trouble is that in most cases adhesions or the condition of the lung itself prevents collapse."

Drainage of the abscess would seem to be the simplest and most logical method of treatment, but once again, "There is a fly in the ointment." The solitary, walled off abscess is rare. It is much more common to find general bronchiectatic dilatation with an area of involved lung surrounding it, or multiple miliary abscesses scattered throughout a lung area. For such conditions simple tubular drainage is futile. The posttonsillectomy abscess is often of this bronchiectatic type.

Extrapleural thoracoplasty is used in multiple bronchiectasis. It consists in an extirpation of the bony thoracic wall overlying the involved area of lung. Hedblom says of this operation, "There are many bad results, probably due to failure to perform an extensive enough operation, or to too extensive an operation at one sitting. To a greater or less degree this operation must form the basis of any radical work performed for the cure of lung abscess."

Lobectomy is a radical attempt to remove the affected tissue as in an appendectomy or cholecystectomy. By the original methods, formerly in use, this gave a mortality of fifty per cent. in a combined series of sixty-two cases.

Evarts Graham, professor of surgery in Washington University, St. Louis, has recently (1923) advocated partial pneumectomy with the actual cautery—a soldering iron heated to a cherry red heat. His original communication reported three cases without a death. Other cases have since been reported. We will describe his method in greater detail later on.

OPERATIVE TECHNIC

The operation is preferably delayed until the acute stage has subsided. A one stage operation is done only in those desperately ill, with high temperature and sepsis. The patient empties his lungs by the inverted position immediately before operation. As a number of successive steps must be taken it is important that the first operation should be painless. Local anesthesia with the aid of a little gas-oxygen is used. A posterior paravertebral incision at the angle of the ribs makes it possible to inject the intercostal nerves with novocaine and alcohol and thus render the chest wall insensitive for future procedures.

A portion of the ribs six to ten cm. long is resected and the wound closed. Later the anterior end of the same ribs is removed. This may be enough, but, if necessary, other steps remove the central portions. If thoracoplastic collapse is the aim in view it can now be secured.

If cautery excision of an affected lobe is desired less extensive exposure will suffice. Adhesion of the lung to the chest wall is absolutely necessary. Usually it is present, but, if it is absent, it must be induced.

The diseased portion of the lung is then directly attacked by the red hot soldering iron and an excavation made in the lung tissue. The operation is really a lobectomy done with the actual cautery. It may be divided into as many stages as are desired or considered necessary. At its completion a large cavity is left with a charred lining. This separates in two weeks. Secondary hemorrhage would, theoretically, be feared, but has not occurred in the reported cases. If it should occur, packing would easily control it because of the low pressure in the pulmonary artery.

AFTERCARE

This consists of fresh air, forced feeding, postural drainage, if indicated, and especially of heliotherapy and exposure of the wound to the air.

Although no extensive series of cases has yet been reported of operations by this method, the results seem to be far better than by any other method and it seems to open up a new avenue of hope to these miserable sufferers. Dr. Graham has reported seventeen cases with only one death.

STATISTICS

Whittemore says that "from ten per cent. to thirty per cent. of the cases may be expected to be cured by expectant treatment. Artificial pneumothorax may cure a small number. Bronchoscopic treatment may cure a limited number if treatment is established early. Surgery offers an excellent chance for cure in those cases in which other methods of treatment have failed or are unsuitable." His mortality in one hundred cases was eighteen. He says: "Sixty per cent. to seventy per cent. may be cured or permanently improved. About five per cent. do well at first but later develop hemorrhages and a recurrence of sputum and die."

The Mayo clinic in its 1923 volume reports on forty-six patients with chronic abscess; twenty-two were completely cured; twelve were improved; one was not improved; and nine died, a mortality of about twenty per cent. There were thirteen cases of bronchiectasis subjected to a graded thoracoplasty without a death. All were improved and five were nearly cured. Three were recent cases and the end result was not yet known. Five patients had an abscess combined with bronchiectasis and received a graded thoracoplastic collapse. Three of these died and two were cured, but one of them is a social recluse because of foul breath.

In those who died an autopsy revealed multiple abscesses and bronchiectasis in all.

The history of this condition shows a dark and dismal past, a brighter present and indications of the dawning of a more brilliant future.

474 First Street.

Enuresis*

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Enuresis usually is first noticed as a distressing and abnormal condition in the fourth or fifth year; it may extend to puberty and may continue throughout adult life. There is no distinct age line of demarcation between the physiological and pathological condition in young children, but the trained child usually controls his bladder at the age of four, and some children even at the age of three or two. Enuresis is not noticed as a rule until the child reaches the fourth or fifth year. He then begins to wet himself quite regularly one, two or three times a night. It is usually nocturnal and occasionally is both diurnal and nocturnal. Both sexes are affected with equal frequency. In most cases the condition will cease spontaneously about the eighth year, but sometimes persists until puberty and relatively rarely it may continue to full maturity.

Since the vascular and nervous supplies of the bladder and sexual organs are closely related, it is probable that the development of the latter may have some influence on the urinary apparatus, and in this way might be responsible for the disturbance in the function of micturition.

Before going into the etiology and pathology of enuresis it might be well to take up very briefly the physiological processes involved in normal micturition. Two centres are recognized which control the urinary function. One, situated in the lumbar and sacral regions of the spinal cord, known as the tonus centre, maintains the tonic contraction of sphincters. This centre is bilateral and each half controls the entire bladder (1). The second and higher centre, situated in the cerebrum, designated the inhibitory centre, controls the lower or tonus centre. Grünbaum and Sherrington (2), in their experimental work on apes, place the cortical centres for the rectal, bladder, and sexual functions at the apex of the motor convolution, in other words, in the foot centre. Czylharz and Marburg place the cortical centre of the bladder in the hip region. It is evident that a cerebral condition must be bilateral to cause total paralysis of the urinary function. Urination is therefore not so much a direct voluntary action as an indirect action of the brain in removing or relaxing its control on the spinal centre. It is well also to remember that the sphincters are always under tonic contraction and that the bladder empties itself by the voluntary relaxation of the sphincters and contraction of the detrusor muscle.

In children it has been found that the detrusor muscle is much thicker and stronger than in adults, and the sphincters correspondingly weaker. Chetwood (3) thinks a possible explanation of enuresis may be found in the fact that there is a disparity between the detrusor and sphincter muscles, the action of the former being much stronger than that of the latter; and when the exercise of the will is lost, during sleep, the urine is forced involuntarily from the bladder. Again, the direct desire for micturition is produced by a sense of fullness in the bladder which is directly due to an increased amount of tension or pressure in that organ. This increased pressure causes sensory stimuli to be transmitted to the higher centre which in turn removes its inhibitory control on the lower centre and reflexly brings about contraction of the bladder wall. Another direct factor in the function of micturition is the voluntary relaxation of the sphincters, and still another is the contraction of the bladder wall. It has been shown recently by Amberg (4) that there is no real sphincter in the anatomical sense, but that there is a functional sphincter, which is made up of the longitudinal and circular fibres of the bladder wall.

From the viewpoint of normal physiology of micturition, therefore, we can classify the abnormal condition of enuresis as follows: first, pathological increase in the output of urine thereby producing increase in tension. This occurs in diabetes mellitus, diabetes insipidus, lithiasis, phosphaturia, cerebral conditions; second, reflex origin; the bladder wall is extremely sensitive to reflex stimulation and every psychical act and every sensory stimulus is likely to cause contraction of the bladder muscle. In this class are included all conditions which are capable of producing reflex contractions of the bladder wall, namely, phimosis, paraphimosis, epispadias, hypospadias, balanitis, adherent clitoris or penis, pin worms, adenoids and tonsils, renal or vesical calculi, pyelitis, masturbation, vaginitis, skin diseases of the genital organs, tuberculosis of the genitourinary tract. We may also include in this class all neurotic and psychic conditions which produce reflex contractions of the bladder wall. It occurs quite often in children with neuropathic tendencies. In these cases enuresis either precedes the neurosis or aids in its production. It is usually accompanied by ideas in dreams which are referable to micturition. A third class includes idiopathic or functional disturbances, in which the most careful examination does not reveal any noticeable or specific cause; fourth, the class of cases resulting from endocrine disturbance.

In the first and second classes the successful outcome of treatment depends upon the thoroughness of the examination; the treatment will be simplified if the cause can be discovered and treatment directed thereto. Thorough search for the focal point of irritation must be made. Careful examination of the urine for albumin, sugar, pus, and bacteria is absolutely necessary. The anus and rectum should be examined for fissure, pin worms, prolapse and eczema. If the clitoris or penis is adherent, stripping and separation of the adhesions is required; in phimosis, circumcision is often curative; in a mouth breather, pathological adenoids and tonsils should receive attention; in masturbation, moral influence is requisite; in hyperacidity, alkaline medication combined with hyoscyamus and belladonna, plenty of water during the day, correction and regulation of

*From the Urological Department, Beth Israel Hospital, service of Dr. Abr. L. Wolbarst.

diet. Epilepsy must be excluded by having the child watched through several nights.

In those cases in which no specific cause can be determined, the following general instructions are given to the parents. Regulation of diet; all irritating articles of food especially tea and coffee should be avoided; improve hygienic conditions; fresh air, exercise and frequent bathing. Little or no fluids should be taken at least three to four hours before bedtime. Empty bladder immediately before retiring. The child must be awakened at a stated hour usually one or two hours after falling asleep and again during the night if that is found necessary. It will be found that the hour of bedwetting is usually fairly constant, and the child should be awakened to void about one half hour before its habitual time of involuntary micturition. In due time the child will acquire the habit of getting up of its own accord. Training the child to awaken voluntarily is the one essential towards a permanent cure. Scolding and punishing the child help little and often aggravate the condition.

Atropine and belladonna are the drugs usually employed. These drugs act on unstriped muscle fibre and the effects are probably due to allaying the excessive irritability of the muscular coat of the bladder. We have had excellent results at our clinic with tincture of belladonna, gradually increasing the dose, beginning with ten drops three times daily, until the physiological effect has been obtained; this is made manifest by dryness of the throat, flushing of the skin and loss of accommodation. Atropine sulphate may be used instead of belladonna, administering one grain to two ounces of water, so that one drop contains about one thousandth of a grain of the alkaloid and increasing the dose one drop every day until enuresis is controlled or toxic symptoms develop. Saxl and Kurzweil (5) have given as much as one twenty-fifth of a grain of atropine sulplate without untoward effects. F. DeAngelis (6) and Carl Pototsky (7) have used camphor with success. They believe that the camphor has a sedative effect upon the genitourinary organs. Its effect, if any, may be due, first, to a depression on the inhibitory centre of the brain, later the spinal cord, and lastly on the terminal endings of the motor nerves. From experiments it would seem to interrupt the connection between the sensory and motor cells (8). DeAngelis (6) reports improvement or cure of enuresis in six of eleven cases by giving injections of camphor from one to six evenings. Carl Pototsky also has obtained excellent results by the employment of camphor. He prefers a combination of pure camphor and bile acids known as codechol. He gives four codechol tablets daily for a period of two weeks and repeats the treatment if necessary after an interval of a few weeks.

Amberg (4) mentions the experimental work of Weitz and Gotz who used a manometer to test the pressure changes in the bladder. They found that the bladder of enuretics behaves exactly like the bladder of normal persons in regard to pressure changes but that there was one significant difference, namely, the enuretics experienced no desire or little desire for urination. In order to increase the sensitiveness of the bladder they introduced silver nitrate solution from one to 4,000 to one to 750 into the bladder to its full capacity. They claimed good results in more than fifty per cent. of the cases.

Electricity has been extensively employed, the anode placed over the lumbar regions and the cathode over the bladder or on the perineum. The good results claimed by some are probably psychical. The same applies to the urethral electrode. Sounds and deep instillations of silver nitrate one half to two per cent. are useful in cases due to a hyperesthetic posterior urethra. Epidural and retrorectal injections from five to fifty c. c. of normal saline (9) have been used and its good effects are thought to be due to the stimulation of the inhibitory centre. Fluid extract rhus aromatica ten to eighty minims three times daily has been stated by some to have given remarkable results. Keersmacher claims excellent results with tuberculin. He believes that enuresis is a manifestation of slight general pulmonary tuberculosis (10).

Regarding endocrine disturbances: Sundell (11) believes that the predominating cause of enuresis is found in the dulling of the cerebral perception. He has had good results in children with the use of thyroid, especially in those cases with backward mentality. Hertoghe and Williams (12) also report good results with thyroid. They give children under six, one half grain twice daily and older children one to three grains twice daily. Saxl and Kurzweil note that many children with definite stigmata of hypothyroidism and pituitarism do not have good control over urination especially during sleep. In a series of thirty cases at the Beth Israel Clinic we have had striking results with pituitary substance, one grain three times daily and gradually increased, if necessary, to three grains three times daily. Many of these cases failed to reveal any specific cause or signs that might help in the diagnosis. Tincture of belladonna, atropine sulphate, quinine, and other drugs were employed, as well as mechanical means, such as deep instillations, sounds and electricity, all without results, until pituitary body was administered. In many cases improvement occurred almost immediately. In fifty per cent. of the cases, a definite cure was noted, twenty-five per cent. showed marked improvement after two weeks to three months. Whether the pituitary increases the inhibitory action of the higher centre on the lower centre or diminished the irritability of the lower centre so that it does not respond so readily to the various stimuli, or whether it increases the tone of the bladder muscle, has not been definitely determined as yet. This still requires much further investigation.

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266 East Broadway.

Practical Therapeutics

INTRAVENOUS THERAPY; A RETROSPECT

W. Forest Dutton, M.D.
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The history of intravenous therapy dates from the seventeenth century. Although certain allusions to this form of treatment are made in the fragments of Egyptian history, authentic evidence is lacking. The *Wisdom Book of Tanaquila* refers to the custom which appears to be blood transfusion, and Howphile's *Treatise on Anatomy* clearly refers to it.

Many references are made in ancient, profane, and sacred literature to blood transfusion, but few report its success as a therapeutic measure.

The discovery of the circulation of the blood by William Harvey (1613) made possible the realization of that which previously had been a mere figment of imagination. Any attempts at blood transfusion before the time of Harvey's discovery were undoubtedly elusive fabrics of experimental endeavor because of two important facts: 1. That the idea of this operation could not occur to anyone to whom the circulation of the blood was unknown; 2, that the phenomenon of the circulation of the blood was not discovered until the seventeenth century.

Harvey's book, *De Motu Cordis,* was published, in 1628, at Frankfort. In 1652, Francisco Folli wrote a book on blood transfusion which gives evidence that he was familiar with the theory of transfusion, that he had worked out a technic for it, and invented instruments for carrying it out. The first authentic record is that published in the *Philosophical Transactions* for January, 1667, wherein Richard Lower gave a complete and detailed account of the technic of blood transfusion.

The possibility of administering medicine by direct admixture with the blood stream probably coexisted from the beginning with the idea of transfusion, but the first authoritative record of any such attempt is found in the *Transactions of the Royal Society* of England, volume 1, page 96, where Robert Boyle, the celebrated physicist and chemist, states that early in the year 1657 the suggestion of intravenous medication was made to him, not by a physician or a physiologist, but by an architect —no less a person than Sir Christopher Wrenn himself. The experiments undertaken at Sir Christopher's suggestion by Timothy Clark, Robert Boyle, and Nathaniel Henshawe were not crowned with startling success, and this further complicated the vexed question as to national precedence in the introduction of intravenous therapy.

The English, French, Germans, and Italians of this time were all participants in the controversy over priority.

Much experimentation was done the following one hundred years, and, notwithstanding the Cassandra like prophecies, little progress was made in intravenous therapy until after the discovery by Landois, in 1875, that animal serum will hemolyze human blood.

The subsequent discoveries of Maragliano (1892), Landsteiner (1901), and Eisenberg (1901), that the sera of diseased and even normal donors will hemolyze alien blood, have revolutionized the whole subject of transfusion and made intravenous therapy possible.

In 1903, I found, after three years of research, that iron cacodylate, sodium cacodylate, sodium cinnamate, sodium citrate, sodium iodide, sodium thiosulphate, solution of iodine compound, strontium bromide, diuretin, hexamethylenetetramine, collargol, calcium chloride, antimony and potassium tartrate, and quinine and urea hydrochlorate were applicable in disease by intravenous administration. This was well supported by clinical evidence.

The introduction of therapeutic agents into the circulation was uncommon. When this method was used the physician brooked the censure of his confrères and controversies were inevitable. The advent of Ehrlich's discovery, made public in 1910, marked the greatest innovation in intravenous therapy.

Ludwig Hektoen, of Westby, Wisconsin, first pointed out the possible danger from isoagglutination in the transfusion of blood. The work of Janksy (1907) and Moss (1910) made acceptable classifications in blood grouping. Closely upon this followed the epoch making achievements of Carrel, Crile, Lindemann, Huston, Weil, Lewisohn, and Agote. Thus, blood transfusion and the administration of medicaments into the circulation have advanced simultaneously.

Although intravenous therapy is now a well established method of administering drugs to the human organism, and amply supported by clinical evidence, some authorities still maintain that the introduction of therapeutic agents into the veins for the cure of disease is unwarranted, unscientific, and a dangerous practice. This would seem unjust *ipso facto* that the intravenous use of such drugs as arsphenamine, mercurochrome-220, antimony and potassium tartrate, gentian violet, flumerin, fuchsin (medicinal), and acriflavine, the most potent, yet the most toxic of drugs, have proved invaluable in the treatment of disease; and cannot with safety and efficacy be administered in any other way.

It is perhaps true that in intravenous therapy, as well as in the oral, hypodermic, and intramuscular administration, many drugs are given without knowledge of the true pathological condition or definite indication. The fault is not in the method but with the physician. It is as absolutely essential for a physician to know the therapeutic and physiological effect of a medicament used intravenously as by any other method. A knowledge of biochemistry and mastery of technic are also necessary to successful treatment by this method.

The period of two decades of therapeutic nihilism in this country undoubtedly had a constructive effect on therapeutics. It led the profession from the empirical to the more specific methods in therapy. For this reason it is difficult for many to grasp the

rationale of present day methods. With increased knowledge of the technic of using drugs, with the development of pharmacology in its true relationship to pathological variations in the organism, it seems reasonable that intravenous injections will be limited to certain chemotherapeutic classifications. This advancement will tend to avoid the accidents and disappointments that must follow the abuse of a method which rightly employed may be a health making and life saving measure.

Investigators agree that drugs administered by mouth, subcutaneously, or intramuscularly undergo certain modifications in the normal human organism, and in pathological conditions frequently change in chemical constituency. They are also cognizant of the fact that an inhibited peripheral circulation is not conducive to a rapid general dissemination of drugs given hypodermically.

In cases of known pathology, drugs such as arsphenamine, iron cacodylate, sodium iodide, mercury bichloride, quinine, iodine, sodium salicylate, antimony and potassium tartrate, diuretin, hexamethylenamine, when indicated, should be administered intravenously to secure definite results.

It is not maintained that all drugs should be given intravenously, but when admissible and properly prepared they can be used with impunity.

The question is asked, "What is gained by choosing the intravenous method in the use of drugs?"

The following is submitted: a, Accuracy of dose, b, ease of administration, c, maximum potency in a minimum of time, d, control of patients, and, e, definite results.

Then follows the question, "Is there any evidence that they are more efficacious administered in this way than by the mouth or under the skin?"

A number of diseases, with remedies, are enumerated which allows the reader to make his own inference: Acidosis, sodium bicarbonate, gum acacia in glucose, in diabetics and others when unable to retain by mouth; actinomycosis, potassium iodide, sodium salicylate; anthrax, antianthrax serum; anemia, iron cacodylate, citrate solution, germanium dioxide; bilharziasis, antimony and potassium tartrate; botulism, strophanthin, antitoxin; bubonic plague, Yersin's serum, antiplague serum (Pasteur); cholera, sodium bicarbonate, sodium chloride, calcium chloride; filariasis, sodium antimonium tartrate, colloid antimony sulphide; granuloma inguinale, antimony and potassium tartrate; keloid, fibrolysin; leishmaniasis, antimonium tartrate; leprosy, sodium gynocardate, sodium morrhuate; lobar pneumonia, quinine and urea hydrochloride, serum free solution of pneumococcus antibodies, caffeine, sodiobenzoate, adrenalin in normal salt solution; mercurial poisoning, acute, Fischer's solution, calcium sulphide; pulmonary spirochetosis, iodine, guaicol, fuchsin (medicinal); pyelitis, hexamethylenamine, electrargol, mercurochrome-220, acriflavine; septicemia and pyemia, iodine, electrargol, mercurochrome-220, gentian violet, collargol, magnesium sulphate; shock, colloidal gelatin and sodium chloride, epinephrine in saline solution, strophanthin, caffeine, sodiobenzoate, digitan, strychnine; syphilis, arsphenamine, calcium acetylsalicylate, antimony and potassium tartrate, sodium or potassium iodide, tryparsamide, mercury bichloride, flumerin; tetanus, antitoxin; typhus fever, serum, chlorine water; trypansomiasis, tryparsamide; yellow fever, Noguchi's serum, chlorine water, saline and sodium bicarbonate solution; yaws, mercuric chloride, arsenous iodide, sodium iodide; Rocky Mountain fever, serum; goitre, Lugol's solution; osteomyelitis, Credé's colloidal silver, gentian violet, iodine, mercurochrome-220.

The following are references to physicians whose scientific attainments cannot be questioned: Rosewater, Farrar, Vander Veer, Dickinson, Bateman, Fairly, Eichhorn, Regan, Bowcock, Rowland, Christopherson, Pavy, Petillo, Dickson, Howitt, Graham, Schwartzer, Heggs, Blackfan, Sellards, Chatterjee, Adler, Leonard Rogers, Horwitz, Randall, Rundal, Smare, Beck, Neuhof, Baliss, Neilson, Orlando, Schamberg, Greenbaum, Brachio, Fox, Mackie, Piersol, Bockus, Stevenel, Muir, Harper, Brahmacheri, Knowles, Conner, Litchfield, Stengel, Stevens, Wells, Blankenship, Haskell, Carder, Coffendaffer, Weiss, Burmeister, Reasoner, Nichols, Risquez, Hill, Colson, Young, Necker, Archard, De Castro, Gupta, Piper, Kiehne, Louros, Hogan, Lewis, Cornioley, Kotzareff, Crile, Henderson, Hazra, Boas, Harrison, Lovenz, Loevenhart, Blackwen, Hodges, Stokes, Sezary, Pomart, Walker, Ashhurst, Cammert, Freedlander, Matthias Nicoll, Danieloplu of Bucharest, Brown, Pierce, Low, Newman, Marshall, Fischer, Linser, Rosenbeck, Wolf, Spittel, Noguchi, and Park. These names are given in sequence as the diseases and drugs in the preceding paragraph for the reason that these physicians and investigators have presented clinical evidence of the efficacy of drugs administered intravenously in disease.

It has been observed that one patient died from an injection of salt solution, and, also, that "in one of our leading hospital clinics, intravenous salt solutions are prohibited except in emergencies, hypodermoclysis being the approved practice. A hypertonic or hypotonic solution is capable of profoundly disturbing the salt balance in the blood and doing harm, whereas no such harm exists when the solution is given under the skin." Here, again, a knowledge of the pathological condition is necessary. Why give salt solution if it is not indicated?

Since June, 1903, I have given over three hundred thousand intravenous injections including one hundred and forty drugs administered in one hundred and thirty diseases. During the school year 1922-23 and 1923-24, in my classes in intravenous therapy at the Graduate School of Medicine, University of Pennsylvania, I exemplified the efficacy of this method of treatment in the most serious cases obtainable from the wards of the Polyclinic Hospital.

In the period of years from 1903 to date, I have not had a death due directly or indirectly to a drug administered intravenously. Many of my colleagues have given over one hundred and fifty thousand injections without a fatality. This, I am sure, compares favorably with any other form of therapy.

A survey of the activity of the medical practitioners of the United States will reveal that recent graduates are using intravenous therapy extensively and with excellent results. This, in my opinion, confirms the high estimate accorded the profession of our country by our foreign neighbors.

I admit that it is as dangerous to place potent drugs for intravenous therapy in the armamentarium of an ignoramus as to trust a fool with a can of nitroglycerin. Thanks to the high standard of medical education in the United States, there are few of this class remaining to ply their nefarious business!

It is my belief, which is based on experimental and practical experience, that intravenous therapy properly applied will open the gateway to a fertile field of constructive effort in the treatment of disease and will eventually revolutionize the practice of medicine.

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225 Blackburn Building.

THE INTRAVENOUS NEEDLE

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Successful intravenous therapy depends on two things: a properly sharpened needle and an educated tactile sense. Delicacy of touch can only be acquired through experience. Needles should be personally sharpened, and receive the care given to other delicate surgical instruments.

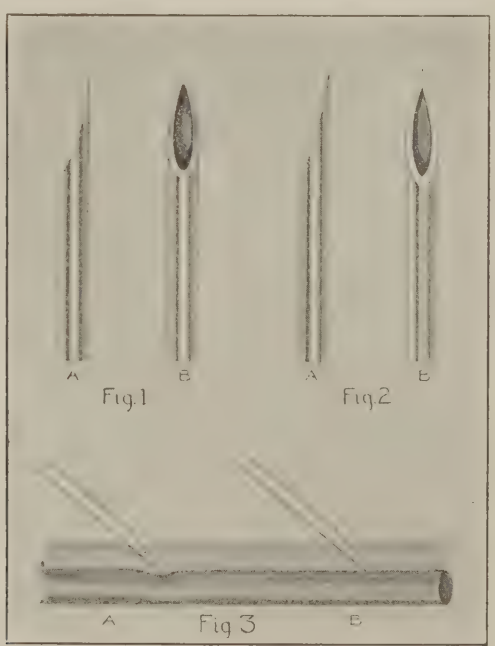

Fig. 1.—Point of the intravenous needle as furnished by the manufacturer. Showing A, the concave bevel edge with resulting shoulder, and B, the tendency to an obtuse chisel point.

Fig. 2.—Properly sharpened intravenous needle with A, a straight bevel edge without shoulder and B, an acute point.

Fig. 3.—Degree of skin and vein wall resistance to the point and shoulder of the commercial needle, A, and to the properly sharpened needle, B.

Hypodermic needles as furnished by the manufacturer are unfit for smooth accurate intravenous work. This is especially true of the larger calibres used in blood transfusion. The commercial needle is sharpened on a small stone wheel, which cuts the beveled edge as a concave surface, and tends to make a chisel instead of an acute point (Fig. 1A and B.) Puncture of the skin and vein wall with such a point requires force and the needle goes through with a jump. When the beveled edge is half way through, the shoulder on the concavity presents itself; more force is necessary, and a second jump occurs. (Fig. 3A.) This irregular jerky puncture has a tendency to push a small vein to one side or to perforate and go directly through a delicate vein. It also gives pain to the patient.

The ideal needle should have an even acute point and a straight flat bevel (Fig. 2 A and B). There is no jump as it goes through the skin or vein wall. The sensation is that of skin puncture by a fine, sharp bistoury. The feel of the needle entering the vein is accurately communicated to the finger. A hard oil hone is the best stone for working down a flat bevel and sharpening the acute point.

300 North Broad Street.

Atropine Therapy.—M. A. Leavitt (*American Journal of Surgery,* January, 1924) says that in a large general hospital, where the anesthetist is frequently confronted with a case on the etherizing table that has a proper setting for respiratory sequelæ to complicate the ether anesthesia, she believes that forced doses of atropine given for forty-eight hours have helped to mitigate the symptoms and sometimes possibly to check them from developing.

Treatment of Hodgkin's Disease.—William S. Stone (*Canadian Practitioner,* March, 1924) says that the x ray and radium are only palliative agents in the treatment of Hodgkin's disease. Palliation can be accomplished in sixty per cent. of cases, and complete restoration of health with or without complete regression of the tumors may result in about thirty-two per cent. Restoration of health will often last for a year and rarely two, three, or four years. Palliation, if it is to follow, will begin after the first or second treatment. Life may be prolonged one or two years.

Simple Treatment of Hiccup by the Production of the Sneezing or Vomiting Reflex.—T. Hishikawa (*Schweizerische medizinische Wochenschrift,* April 10, 1924) recommends two simple procedures for the inhibition of hiccup. The first method is to produce a sneezing reflex by irritating the nasal mucous membrane with a thin feather or a narrow strip of paper. The second method consists in producing a vomiting reflex either by the administration of digitalis or by mechanically irritating the pharynx.

Anthrax and Its Treatment—H. E. Santee (*Annals of Surgery,* September, 1923) sums up his findings as follows: Thirty-seven cases of anthrax are reviewed. This disease tends toward a septicemia from the local lesion. Specific serum offers a very fair prognosis. Its use should be intensive, both intravenous and local, at the outset. Surgery has no place in the treatment of the lesion. Its use may be directly harmful.

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Abdominal Tuberculosis and Intestinal Stasis

JAMES TAYLOR, F.R.C.S. (Edin.)

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It is many years since Sir Arbuthnot Lane said that there was no tuberculosis without previous intestinal stasis, and this remark suggested to me an inquiry into the evidence of stasis in cases of abdominal tuberculosis, and the effect in these cases of measures for the relief of this static condition. I have now investigated twenty-four cases, and while I hope at a later date to deal with the subject more fully, I think the results of the treatment adopted are such as to warrant the publication of a preliminary report.

The cases under consideration are those which are commonly called, and usually notified as, tuberculous peritonitis, but while the peritoneum is probably involved in every case, the term covers an infinite variety of pathological conditions, and in many of the cases the changes in the peritoneum are of comparatively slight importance. In eleven cases the peritoneum was greatly congested, studded all over with tubercles, and many adhesions were present. The mesenteric glands were the parts chiefly affected in another eleven cases. There was one example of ileocecal tuberculosis, with great thickening and infiltration of the bowel, and fixation to the surrounding parts. In one other case the small intestine was extensively ulcerated and greatly deformed. The patients were all in Robroyston Hospital and Sanatorium and some of them had been under treatment there for a considerable time, without undergoing any material change.

Perhaps I may be excused if I state briefly the means by which any delay in the emptying of the bowel becomes such a serious predisposing factor in abdominal tuberculosis, although it is the same mechanism which has been described so many times in connection with other diseases. The fault is primarily in the colon, which, failing to empty with normal rapidity, becomes overloaded, and by its weight tends to fall downwards. Nature in her effort to prevent this ptosis, develops certain bands which attach themselves to various parts of the bowel, and although they are beneficent in their first effect, they tend later to increase the trouble. The bowel becomes kinked at the points where the bands are attached and obstruction with further delay results.

This stasis predisposes in two ways to tuberculous infection of the alimentary tract. The toxemia which is caused by the absorption from the intestine devitalizes the tissues of the body generally. The intestinal wall shares in this poisoning process, and becomes more liable to infection with the tubercle bacillus, to whose attacks it is almost constantly exposed. Again the general delay in the passage of the bowel contents exposes the wall of the intestine to repeated trauma, which is all the more serious as the proliferation of organisms is also facilitated by the stasis and small lesions in the mucous membrane resulting from injury and infection pave the way for the onset of the tuberculous process.

It seems a fallacy to suggest that stasis is present in these cases, as the symptoms usually complained of are rather too rapid emptying of the bowel, and x ray examination confirms this quick passage of the intestinal contents, but at the same time shows a relative delay at certain points. Doubtless if one could have x rayed the patients before the tuberculous infection had taken place, it would have been possible to show that there was a period during which there was actual delay. But apart from indicating the points at which there is still some control of the passage of the meal, the x ray is helpful for distinguishing between the cases that are suitable for operation and those that are not.

X rays showed the barium meal scattered diffusely through the small intestine, five hours after it entered the stomach. In practically all cases which give this appearance, adhesions are so universal that it is impossible to define the relations within the abdomen, in fact it may be impossible to open the peritoneal cavity. A somewhat similar picture was seen in a case of extensive ulceration of the intestine, without many adhesions, but in this case, while there was a considerable amount of the barium scattered through the loops of the small intestine, a large amount had passed into the ascending or transverse colon. A third plate showed the usual appearance in a case with an ileal control, and in which one would expect a good result from operation.

The points of obstruction were invariably those described by Lane in his book on intestinal stasis,

namely, one under the pelvic colon, the first and last kink, and the other at the terminal ileum. The obstruction at the latter point was caused in most of the cases by a controlling appendix, that is, an appendix fixed by a band under the last part of the ileum, in such a way that with the drag of the cecum on one side and the loops of small intestine on the other, the last part of the small bowel is acutely bent over the cord which the fixed appendix represents. In the other cases, with one exception, there was a well formed band close to the cecum and under the ileum, fixing this part of the bowel, and sometimes rotating it markedly on itself.

Of the twenty-four patients operated on, in seven the adhesions were so diffuse that it was impossible to examine the relations of the various parts of the intestine, but of the remaining seventeen there was no case that did not show definite evidence of the formation of bands, extremely faint in some of the young children, but quite easily defined. There was a definite band under the pelvic mesocolon in every case but one. This exception was a child of three with a long mobile loop of pelvic colon. The band under the ileum was present in six cases, and all the others had controlling appendices. One child of two years had a first and last kink, an ileal band, and a controlling appendix.

The operation performed was a careful division of the bands, freeing the bowel and allowing the fixed loop to be straightened out, followed by accurate suturing of the peritoneum over the raw surfaces. The controlling appendix was removed at the same time.

Case I.—S. R., aged seventeen, was admitted complaining of pain in the abdomen of five months' duration. There had been one attack of diarrhea followed by constipation which persisted till admission to hospital, when it was found that the bowels only moved in response to doses of cascara and liquid paraffin. The patient was emaciated, the abdomen retracted and resistant. Laparotomy was performed when a well marked band under the pelvic colon was divided. A band under the ileum causing marked rotation of the bowel, was also divided, and a retrocecal appendix removed. After the operation the bowels moved without any aperient, and the patient put on thirteen pounds in a month. She was dismissed from the hospital well.

Case II.—B. L., aged seventeen, was admitted complaining of amenorrhea and abdominal pain. The bowels were inclined to be constipated. The patient was rather flabby and fat, and the abdomen resistant. No masses could be felt, but there was well marked tenderness over the terminal ileum. After resting four and a half months the pain had gone but otherwise the condition was unchanged. Laparotomy was than performed, and both visceral and parietal peritoneum were found studded with tubercles. There was a large mass in the lower abdomen consisting mostly of infiltrated omentum. A dense band passed from this mass to the left parietal wall, compressing the pelvic colon. This band was divided and the sigmoid loop raised. A band under the pelvic mesocolon was then divided and the raw surface peritonized as well as the infiltrated and friable peritoneum allowed. A controlling appendix was also removed, although there was considerable infiltration of the parts around. Three months later the patient was discharged feeling perfectly well. She was thinner and much healthier looking. Menstruation which had been in abeyance for seven months returned soon after the operation and was regular till she left hospital.

Case III.—T. O., aged nine, was admitted with a discharging tuberculous sinus over the lower third of the thigh. There was no evidence of disease of bone, but he began to lose weight rapidly till at the end of two months he had fallen from sixty-five pounds to forty-two pounds. The bowels were constipated but he had an occasional profuse watery stool. He vomited at frequent intervals. Laparotomy was then performed an dextensive ileocecal tuberculosis found. In his exhausted condition resection was out of the question. There was a dense controlling band under the pelvic colon, which was divided and the raw surface peritonized. Improvement began at once. The sickness stopped and he steadily increased in weight till at the end of six months he had reached sixty-six pounds.

Case IV.—W. W., aged thirty-six, admitted complaining of pain in the epigastrium and diarrhea of four years' duration. The pain was always worst about half an hour after food and was accompanied by occasional vomiting. The abdomen was distended and rather tender in its lower half. Laparotomy was performed and advanced tuberculous disease was found in the lowest two feet of the small intestine. There was evidence of extensive ulceration of the bowel with much deformity, the bowel being constricted at various points, and ballooned at others. The pelvic colon was long and there was a well developed band on the under surface of the mesocolon, and another controlling the end of the ileum. These bands were divided. The patient's condition gradually improved. He had little pain almost from the first, and at the end of four months only very occasional diarrhea. These cases are types of the various conditions dealt with, and although in every case the results were not as striking as these I have described, in all but one there was definite improvement where obstructing bands were divided. Even among quite young children, who had only the earliest stage of secondary change, the improvement was distinct. Their diarrhea was less marked or disappeared entirely and they were altogether brighter and happier. No doubt all their organs became healthier, when their drainage system was improved and they were freed from the intestinal toxemia. Yet the operation was comparatively simple and one would not expect its results to be phenomenal. Even in the cases with the densest bands and the most severe kinking the lumen of the bowel was not much narrowed. I can only suppose that the peristalsis of the bowel is interfered with in some way, in any case there is no doubt about the marked effect on the patient of the operative correction of these partial obstructions.

Dr. White Robertson has pointed out the effect of the master toxin—usually an intestinal toxin—in cases of tuberculous disease, and Mr. Morriston Davies in his lecture on Pulmonary Tuberculosis and Intestinal Stasis, has shown that many of the febrile attacks to which phthisical patients are subject are due to an exacerbation of their intestinal toxemia as demonstrated by an increase of the sulphoethers in

the urine. He has also shown that if a reaction is to be avoided in treating cases by artificial pneumothorax, the patients must be prepared beforehand by the clearing out of the bowel, and the administering of intestinal antiseptics, and toxin adsorbents like kaolin. I have noticed also that the digestive troubles among pulmonary cases are frequently the direct result of intestinal stasis. In some of the more severe cases of sickness and vomiting, cases which refused to respond to medicinal treatment, I have seen the gastric symptoms entirely disappear after the division of bands at the terminal ileum and the pelvic colon, and without any interference with the stomach itself.

In young children I should think that medicinal treatment for the stasis would usually be enough, as only the earliest changes in the bowel have taken place, and marked controls have not developed. In the group of cases I have described the benefit resulting from the operation was, as a rule, in proportion to the age of the patient, because the longer the stasis had been going on, the more marked were the secondary changes, and the greater the need for operative relief.

I am indebted to Dr. John Watson for permission to use the hospital records, and for his kindness in facilitating my work. I also have to thank Dr. Fergus Henderson for the radiographic examination of the cases.

20 Park Circus.

Certain Types of Advanced Tuberculosis; an Economic Asset

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After the discovery of the tubercle bacillus by Robert Koch in 1882, the medical profession felt that, knowing the causative factor in the disease, it would be only a matter of a few decades when tuberculosis would be as rare as smallpox after vaccination was given to the world by Jenner. All that remained to be done was to keep the active cases from spreading infection from one to the other, and this could so easily be accomplished by a campaign of education fostered by such an association as our own national organization.

The failure to stamp out tuberculosis is only too well known to need comment. The failure to find a specific to cure the already existing cases is likewise medical and general history. It took the profession years to learn that the educational campaign must be directed against the infant in arms if it was to curtail even to a small extent the development of adult tuberculosis.

Not only in the prevention of the disease have we been slow to hit at the fundamentals, but equally so in our education of the physician in the essentials of an early diagnosis. Too often is the early type case sent from the doctor's office with a pat on the shoulder and with the assurance that there is nothing wrong with him—only to have the disease make deeper inroads into the already infected lung, and turn this favorable and curable case into one that is probably doomed to failure.

In the past this has been due to lack of interest in our medical schools. To advocate the teaching of tuberculosis was to provoke a smile and to even hint at the necessity of a chair or a department where the student might learn the principles of diagnosis, was to argue one's fitness for an asylum.

Times are changing, and the better schools are turning their attention to a study of the disease, and year by year students are graduated with at least a working knowledge of physical diagnosis. Yet, today, the percentage of early cases is on the wrong side of the ledger. In the Southwest sixty per cent. of our admissions are in the far advanced stage of the disease.

Tuberculosis, to be cured or properly arrested, must be taken early, otherwise we are merely prolonging a life of invalidism. Yet the percentage of recoveries in advanced disease is so surprising that we must needs devote our attention to that large class of patients who have been permitted to reach that unfavorable classification.

Incipient tuberculosis is cured in the majority of cases; moderately advanced in less numbers, and far advanced cases offer but a piteously low percentage of real arrests. Yet, as I have stated, that class is the one with which we are overwhelmed, and the class which taxes the wits of the physician who comes in contact with its countless hordes. To look wise and give a fatal prognosis is not the mission of the honest practitioner of the healing art. The problem must be attacked from all angles; yet, how many of us have faced it from a practical viewpoint?

When I began the practice of tuberculosis as a specialty, I was inclined to keep the far advanced patient under sanatorium care as long as possible, never daring to permit him much leeway in exercise; and only when it became an economical question did I dare face the issue. The result was disastrous. Here was a man who had been kept indefinitely on the rest cure, suddenly thrown upon his own resources—forced to make a living for himself and family, and ill prepared for the emergency. It required but a short time to undo all the good that had been done by the sanatorium care and treatment. He relapsed—there was no other way out.

Gradually, as years went by and patients came under my observation who had been working years with advanced disease—only to discover their trouble by an x ray or by accident, I became bolder, and screwed my courage to the sticking point, attempted slowly and with infinite care to get this class of subjects back somewhere near a normal existence.

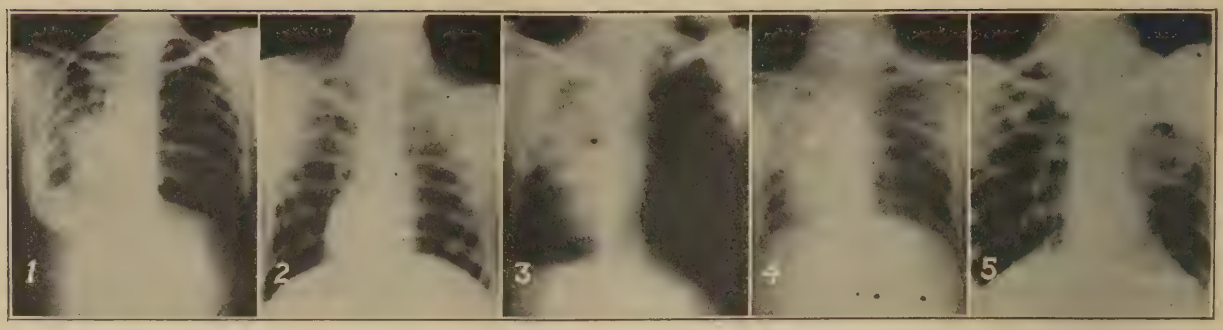

FIG. 1.—Case III FIG. 2.—Case V FIG. 3.—Case VI FIG. 4.—Case VIII FIG. 5.—Case XI

The results were surprising, and as I hope to show you with the appended case histories, well worth while.

Do not misunderstand me—and I know of no other class of people who misunderstand more than physicians. I do not advocate graduated exercise for all cases of advanced tuberculosis, neither do I advocate this to the exclusion of a properly carried out rest cure. The rest cure must come first always, but understand this—that the rest cure must not be carried out indefinitely, if we are to ultimately get a satisfactory result. It is easy to fall into the habit of keeping advanced cases in institutions two, three, four and five years—if they live that long—at bed rest. They are little worry to the medical staff, and they help keep the beds full and raise the length of stay in a given institution. I know, for in years long past I have tried it with this result. But that is not restoring the individual to society. It is merely prolonging an invalid life at the expense of society, and the majority of people I find are glad of the opportunity to test themselves out, to determine whether they are ever to regard themselves as an asset or whether they are to continue existence as a liability. True, occasionally one finds a patient who feels that life in bed is a continuous round of pleasure, but that person is the exception rather than the rule.

How shall we determine rest or exercise in a given patient? Remember, I am speaking of far advanced tuberculosis only, and refer to the individual who has a fair attempt at fibrosis, and do not consider the hopelessly sick consumptive.

First of all, we need a thorough history. Almost as much, if not more, information can be gained from this in forming our conclusions as to the patient's ability to do things, than from any other source. Then there should be a period of observation at comparative rest until patient and physician know each other.

The physical findings should exclude as far as possible activity of the process, but it is my opinion that clinical signs of activity in these cases are more important.

The physical examination of these chests by the average man would keep these patients, who are doing full time work, in bed the remainder of their lives. Most of them are filled with coarse type râles and crepitations over these fibroid areas, which are indefinitely persistent. Case XVII was under observation of the Veterans' Bureau in Albuquerque, and after I had given him unlimited exercise for six months, they told him he still had a great amount of activity, but by great care he might attempt one meal a day in the dining room!

Having determined these factors, meals in the dining room are first tried out—one meal, then two, then all three. No other exercise is given at this time. After trying this for a month, a short walk of five minutes' duration daily is prescribed, which is then gradually run up to full time. Patients who like golf can be relieved of aimless walking by nine to eighteen holes daily. Finally—if they remain with one long enough—I want six months of normal life under close observation.

This method of restoring to lives of usefulness the far advanced tuberculous subjects will not always prove successful. Many times we will attempt it to find it cannot be done, but if the cases are carefully selected, success is more often encountered than failure, and another human being is snatched from a life of invalidism.

The appended cases are selected at random from our records at St. Joseph's. These could be augmented many times, but space forbids. They are typical of the class for which I ask your consideration. In studying the records, remember none of these patients can be considered apparently cured. All have cough and sputum, and in all, the sputum is

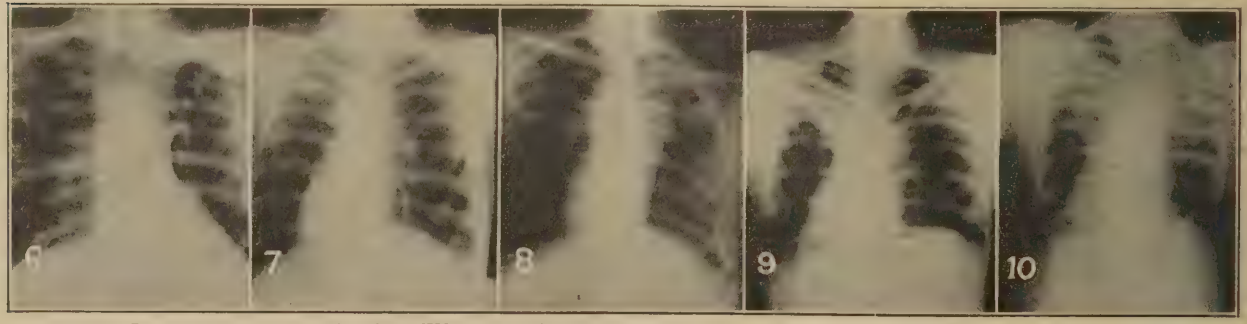

FIG. 6.—Case XII FIG. 7.—Case XV FIG. 8.—Case XIV FIG. 9.—Case XVIII FIG. 10.—Case XXI

positive for tubercle bacilli. Six live in the middle West, four live in California, and the remaining twelve in the Southwest plateau region. We have simply restored a fair degree of physical health, plus a certain amount of fibrosis, and given the individual a chance to live a life of usefulness rather than suffer an existence of invalidism.

Case I.—Admitted September 23, 1920, aged twenty-five. History dated back from July, 1917. Discharged from army because of active tuberculosis. Chest findings showed entire involvement of right lung and upper left through second rib; few râles after cough over these areas. Discharged, arrested September 26, 1921. Has practised law in Albuquerque ever since with no return of activity, chest shows excellent fibrosis with no râles anywhere.

Case II.—Admitted May 31, 1922, aged twenty. History dates back from September, 1921. Chest findings: fibroid tuberculosis both uppers, and râles after cough in these areas. Discharged from sanatorium, improved, May 15, 1923, with exercise up to one hour time daily. Has lived in the city, gradually increasing exercise up to normal life, which she has led past year with no aggravation of symptoms. Married first part of 1924. Chest still shows crepitations left upper.

Case III.—Admitted December 2, 1921, aged twenty-eight. History dates back to spring, 1920. Pulmonary hemorrhage in March, 1921, (twelve in series). Second series October, 1921. Findings: Complete involvement of acute type entire left and central right. Numerous râles increased on cough. Discharged June 1, 1922, improved, to live in the city. Graduated exercise after three months in the sanatorium, up to normal life in six months, which she has followed since. Does her own housework, and enjoys fair degree of health. Chest still shows a great deal of moisture, but the râles are mostly bronchial.

Case IV.—Admitted June 28, 1920, aged twenty-two. History dates back three years. Findings: Complete involvement left upper, large cavity second interspace, râles increased on cough. Exercise gradually increased until June 3, 1921, was leading normal life, and has continued to do this past three years. Chest still shows large amount of fibrosis, with crepitations over posterior portion.

Case V.—Admitted June 1, 1922. History dates back four years. Had followed cure faithfully at bed rest most of that time due to the fact that his physician considered his chest active because of the large number of adventitious râles heard on auscultation. Findings: Involvement left upper and right upper and middle lobes. Crepitations over these areas. Advised graduated exercise at once. In three months was taking one hour walk twice daily, auto rides, etc.; but returned to warmer winter climate where his former physician immediately put him to bed because of so much activity. Was kept at rest all winter, returning to me the following spring, and again we began graduated exercise. By the fall of 1923, he was leading a normal life, with no return of symptoms. At present he is conducting a radio supply house in Albuquerque—married, and has become a useful citizen again. Chest still shows crepitations in both uppers.

Case VI.—Admitted October 4, 1920, aged thirty-eight. History dates back five years. Old fibroid tuberculosis involving entire left lung with cavity formation in upper right. Crepitations over left lung, but none in right. This patient went to Colorado in 1916 where he was kept on the rest cure for four years. By February, 1921, he was taking fifteen minutes' exercise twice daily which was gradually increased, so that on discharge July 12, 1921, he was leading a normal life. He went to Colorado and has been practising law ever since. Chest findings on discharge same as on admission.

Case VII.—Admitted December 17, 1918. History dates back one and a half years—with hemorrhage. Chest showed involvement both uppers with subcrepitant râles increased on cough. Discharged from sanatorium August 8, 1920, condition quiescent. Began work and had another hemorrhage. Rested one month, resumed active life and has been working past three years with no increase of symptoms. Chest still shows crepitations over right upper and over right base posterior, and left upper.

Case VIII.—Admitted January 1, 1922, aged thirty-three. History dates back four years. Old fibroid tuberculosis entire left with large cavity below clavicle. Crepitations upper right over all fibroid areas. Had been kept at bed rest in a middle western institution and given a hopeless prognosis because of the extensive involvement. Decided to make a change to the Southwest, and after a short observation, was given graduated exercise, and in one year was leading a normal life. He opened a store in Albuquerque which he ran for a year, and then accepted a position as manager of a large clothing concern. Condition is excellent, although chest findings are the same as on admission.

Case XI.—Admitted June, 1920. History dates back four years. Took treatment at home during this time. Came to Albuquerque and at once began work, which he has followed ever since, except while confined several times for hemorrhages. Is employed as gardener at St. Joseph's where of course he is under constant observation. Chest shows fibroid tuberculosis with cavitation. Numerous râles over both lungs.

Case XII.—Admitted January, 1911, aged twenty-eight. History dates back five years. Was under treatment three years. Rest one year, graduated exercise and normal life at end of two years. Has been working constantly for past ten years. Chest shows same physical findings today that it did ten years ago, viz., evidence of fibrosis over both lungs especially left, and numerous coarse type râles over entire left lung.

Case XIV.—Admitted May 17, 1921, aged forty. History dates back but six weeks. Chest: Old fibroid tuberculosis of long standing involving right upper and middle lobes, with cavity upper, second interspace. Infiltration left upper to third rib and sixth dorsal spine. Coarse râles over right upper and middle lobes, and subcrepitant râles over left increased on cough. The left lung apparently was giving him acute trouble.

Patient was put on bed rest, temperature came to normal in short space of time, and in twelve months he had gained forty-five pounds in weight.

Graduated exercise started within two months of admission, and he was leading a normal life at time of discharge March 17, 1922. Returned to work in Oklahoma as traveling salesman, but in five months had an attack of pain over appendix region. Came back and a hard tumor mass was felt in this area. After gastrointestinal series of plates were made, a diagnosis of cecal tuberculosis was made; later confirmed by Dr. Archibald of Montreal. He advised against operation. Patient was kept at rest for three months, and then graduated exercise started again—increased slowly to normal life, which he has led since fall of 1923 with no return of abdominal symptoms. Now he is in California and works as traveling salesman. Chest shows dense fibrosis right upper and middle, with crepitations over upper lobe.

Case XV.—Admitted August 29, 1918, aged thirty-four. History dates back eight years. Tuberculous peritonitis in 1917. Operated and tuberculous ovary and appendix removed. Urine: casts and albumin. Chest findings: fibroid tuberculosis both uppers with râles increased on cough. Chest quiescent in one year's time, and graduated exercise up to fairly normal life by time of discharge June 1, 1920. Since then has lived normal life in California with no aggravation of symptoms. Chest shows fibroid tuberculosis both uppers with crepitations over these areas.

Case XVIII.—Admitted April 15, 1921, aged thirty-three. History dates back three years. Chest findings on admission: Fibroid left lung, with cavity second interspace. General infiltration right upper; râles of coarse type over left and subcrepitant râles over right upper. Given graduated exercise after six months. Discharged quiescent April 25, 1922, and has since lived in Pennsylvania with no increase of symptoms. Supervises her housework and cares for a family of three. Chest on discharge still showed coarse râles left upper and crepitations over right upper.

Case XXI.—Admitted March 15, 1917, aged fifty-two. History dates back six years. Chest findings: Fibroid tuberculosis both uppers with râles increased on cough. Discharged quiescent August, 1918, and has since lived a normal life in Iowa, with no increase of symptoms. Chest findings have remained same as on admission in 1917. Verified by us in 1921, and by reports since.

Regardless of the differences of opinion on climate, the patient discussed in this report lives better and longer with his tuberculosis in the arid plateau region of the Southwest, than a person of the same type can possibly do in climates which are less favorable.

[1]Cases IX, X, XIII, XVI, XVII, XIX, XX, and XXII have been omitted on account of lack of space. They will appear in the author's reprints.

Indications for Thoracoplasty in Pulmonary Tuberculosis

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Increasing experience and improved methods of observation are constantly making easier the great problem of prognosis in pulmonary tuberculosis. There is still much to be desired in this direction but, by using data which can be assembled in almost every case, it is possible to follow reasonably closely the undulating state of relative immunity, and often to anticipate the anatomical changes of destruction and repair. The process of healing can be traced by clinical and roentgenographic observation from inception to ultimate completion, and where effective healing is not attainable naturally, this fact can usually be recognized before it is too late to resort to the aid of artificial measures of proven value.

These measures, which are numerous and of variable worth, are included for the most part in the general domain of collapse and immobilization therapy. The rationale of inducing lung collapse by one means or another to promote the healing of tuberculosis is now well understood by most physicians treating this disease, and the results obtained amply justify it as the most important adjuvant to the standard hygienic rest treatment. Its position has been established primarily by the extensive practice of artificial pneumothorax. Valuable as this proved from the date of its introduction by Forlanini and by Murphy, it did not require many years to demonstrate that in a considerable percentage of cases, although anatomically suitable, collapse of the lung is hindered or prevented by the presence of pleural adhesions. As a logical evolution, therefore, attempts were soon made to effect collapse by other and more drastic methods; chief among these is thoracoplasty—resection of a few to eleven ribs allowing one side of the thorax to sink, and thus indirectly bringing about the desired collapse at least in part. The Germans have been the leaders in perfecting and applying this procedure, Sauerbruch alone having seven hundred operations to his credit. As in using artificial pneumothorax, American clinicians have been slow to adopt the method on a wide scale. It is now growing rapidly in favor, as a study of the literature will prove, and, in a strictly limited group of cases, is certain to take its place as a standard aid in treatment.

By those who have had the largest experience it is estimated that from ten to fifteen per cent. of all patients with pulmonary tuberculosis should be treated by some form of collapse and immobilization therapy; at the Loomis Sanatorium where many advanced cases are received the latter figure is approached. In more than half of these the simpler procedure of artificial pneumothorax is adequate. Sauerbruch declares that five per cent. of all cases are suitable for thoracoplasty, and, in a recent review of the subject, Alexander (1) estimates that in the

United States there are now fifteen thousand persons with pulmonary tuberculosis for whom surgical interference is indicated. With this may be contrasted Alexander's finding of 1,024 cases of operation reported from 1918 to 1923.

The operation now usually employed is the Sauerbruch paravertebral rib resection. The complete procedure includes cutting the first eleven ribs close to their vertebral attachments and removing sections from each rib—two to four cm. from the first, and increasing to ten or more cm. from the eleventh. This allows the sectioned ribs to drop and the side of the chest to sink (Figs. 1 and 2). This half of the chest is reduced by one half to two thirds (Saugman), and the lung volume is diminished by three hundred to five hundred c. c. (Sauerbruch and Brunner): where massive fibrosis has previously developed the collapse may be greater. Because of the incompleteness of the collapse it is sometimes necessary to perform supplementary operations, such as a resection of one or two upper ribs anteriorly, or pneumonolysis. Section or avulsion of the phrenic nerve on the affected side with subsequent paralysis of the diaphragm (Figs. 3 and 4) is often done as a preliminary to thoracoplasty: the paralyzed diaphragm becomes immobile (except occasionally for passive movement) in a position a little higher than in normal expiration, and this contributes more or less to the collapse and rest of the lung.

Taking collectively all the thoracoplastic operations which have been performed for tuberculosis, the results have been estimated approximately as one third dead (at operation or due to subsequent complications such as aspiration pneumonia in the better lung), one third improved, and one third arrested and restored to approximately normal lives. Sauerbruch reports thirty-nine per cent. as arrested or "cured." These figures, of course, represent salvage from a group of cases in which the prognosis otherwise was almost uniformly fatal. The hazard is considerably reduced by performing the operation in two or three stages at intervals of a week or more, local anesthesia being preferred in many instances.

Temporary unpleasant effects from the operation include neuralgic pains, cutaneous anesthésias, and circulatory disturbances, but often these never appear. The chest deformity usually cannot be regognized when the patient is clothed. In the type of case usually selected for this operation time has previously elapsed to allow compensatory changes to establish themselves, so that, as a rule, in the favorable, uncomplicated cases, no lasting respiratory or circulatory embarrassment results directly from the operation. With a proper anatomical collapse, healing, which already has been initiated, is allowed to continue unhampered by mechanical barriers, fibrous tissue shrinks and grows more compact, and cavities are further contracted or closed. The symptomatic effect is often remarkable, and even when not completely satisfactory, the patient finds the disability easier to bear and may live longer and more comfortably than would have been possible otherwise.

To define the group of cases suitable for thoracoplasty it will perhaps appear more logical to proceed by elimination, mentioning first the contraindications. The first condition is that an adequate trial of routine rest treatment must be made. This usually suffices in first stage cases in securing a durable arrest of the disease: moderately advanced or second stage cases respond in more than half the instances, but far advanced cases in a much smaller percentage. In favorable cases, healing by absorption and fibrosis occurs, and not infrequently small or moderate sized cavities become contracted or entirely obliterated. Often repair may progress for a period of two to five years or longer before a dependable result is observed. Hence, it is not wise to be tempted to use drastic surgery when the ultimate prognosis appears good without it, the only exception to this being the situation in which, for economic or other reasons, the patient is unwilling to undergo a long period of treatment and prefers to shorten this by assuming the risk of an operation.

Thoracoplasty is not employed when artificial pneumothorax suffices to produce the necessary collapse and immobilization. Even in the presence of pleural adhesions allowing only a partial collapse, air insufflations are not to be discontinued without good reason. Often adhesions can be stretched gradually or are so placed as not to interfere indefinitely; then after patient efforts over weeks or months an effective compression of the lung can be obtained. When unyielding stringlike adhesions interfere with the therapeutic result, some have sectioned the bands by the method of Jacobeus, using the thoracoscope and electrocautery; this, however, entails a risk of pleural infection and empyema twice as great as is involved in the practice of pneumothorax alone, not to mention other minor complications. Thoracoplasty, therefore, is preferable if the lung is badly damaged and adhesions are extensive.

If the better lung must be closely studied before inducing pneumothorax, its status must be even more diligently determined before performing thoracoplasty. It is unusual to find tuberculosis limited strictly to one lung; in most cases at least healed parenchymatous tubercles appear in the better lung. The calcified and fibrotic condition of these deposits can sometimes be determined promptly, in which event, unless spirometric readings show a reduction of vital capacity below fifty per cent. of the calculated normal, they cannot be regarded as a contraindication to the operation. On the other hand a fresh deposit in the better lung, however small, is a deterring sign, and before operation can be advised the lesion must be watched until it is shown that it is dependably nonprogressive and inactive. Intermediate between these two extremes is the largest group encountered, viz., those cases in which small or moderate sized tuberculous masses, quiescent or only partially healed, exist in the better lung. Here delicate judgment is required.

It is always best to defer surgery until one is thoroughly assured that the more diseased lung is not healing and cannot heal naturally and that the lesion in the contralateral lung promises to remain quiescent, although it may continue to cast its shadow in the roentgenogram and give rise to definite physical signs including a few râles which we know persist in healing and healed lesions. In such situations thoracoplasty is usually not contraindicated. The more pressing the need for collapsing one lung the

more risk one must assume with the other or with any extraneous condition which, under less stringent circumstances, would be considered a contraindication; here, the patient must be informed accurately of the situation and his own preference given most weight, since the prognosis with or without operation

Fig. 1.—Progressive chronic ulcerative tuberculosis of right lung treated by artificial pneumothorax. Subsequent perforation of pleura and development of tuberculous empyema with obliterative adhesions.

is usually poor. We have recently had a thoracoplasty done as a last resort in a patient who has a small fibrous walled cavity (less than one cm. in diameter) in her functioning lung, but usually the presence of cavity is an absolute contraindication. We have learned that, after inducing pneumothorax and thereby controlling toxemia and its resulting symptoms, lesions in the functioning lung may proceed to more rapid healing. The same can be expected with thoracoplasty but the initial strain and shock is more severe and the hazard, therefore, greater.

In acute pulmonary tuberculosis thoracoplasty is not advised. Here, fortunately, widespread pleural adhesions have not usually had time to develop, and artificial pneumothorax can be employed in unilateral disease.

Nonpulmonary tuberculous complications are present in most cases of advanced pulmonary disease, and, if so serious in themselves as to impair markedly local function or threaten life, usually contraindicate major surgical procedures. However, the principle suggested above must be kept in mind; namely, that any measure which eradicates or helps to dam up a source of toxemia in one tuberculous focus relieves the opposing forces of bodily resistance against the disease proportionately and contributes just so much to the balance of this resistance against similar sources elsewhere. The observing clinician sees repeatedly the lesions of active intestinal tuberculosis or some other complication subside and become quiescent as lessening toxemia follows the collapse of an extensively diseased lung by artificial pneumothorax. With thoracoplasty, however, the strain of the operation may depress general resistance, and pulmonary lesions may temporarily be stirred up, affecting adversely remote lesions by inducing a focal reaction, which is usually evanescent but occasionally persists. The possible influence of tuberculous complications is, therefore, a matter requiring nice judgment. If one were always intimidated by their mere presence many a patient would be denied the great benefit which the operation often confers, for if the complicating lesion is localized, stationary, or only slowly progressive, and has not seriously damaged local function it is more likely to be helped than hurt following the control of the pulmonary disease by collapse therapy. On the other hand, it is senseless to subject a patient to a major operation when a complication is widespread, rapidly progressive, and of fatal import.

The same principles apply more or less to nontuberculous complications which, however, are not so often encountered. Special attention must be paid to the heart and circulatory system. Fortunately, in cases selected for this operation the heart has previously adapted itself to altered anatomical relationships to which a thoracoplasty will not add a much greater mechanical strain. Naturally, better results are to be expected if cardiovascular tone is not markedly impaired, as determined by blood pressure

Fig. 2.—Same case as in Fig. 1, eighteen months after phrenicotomy, complete thoracoplasty (with later resection of lower ribs over empyema sac), and thoracotomy. Clinical result excellent; loss of all constitutional symptoms sputum scanty; capacity of empyema sac less than twenty c.c. with very slight drainage; patient ambulant and living at home.

observations. In chronic tuberculosis the myocardium is sometimes greatly atrophied, and in such cases thoracoplasty should be advised with caution, if at all. The two or three stage operation, of course, is preferred to the single stage one.

Saugman thinks the operation should not be done

on patients who cannot tolerate a local anesthetic, but when expectoration is slight Sauerbruch has found ether safe.

The indications for thoracoplasty are reasonably positive and clear cut. They exist chiefly in chronic fibrocavernous, predominantly unilateral pulmonary tuberculosis when more conservative measures of treatment have been tried and found wanting. This group comprises four subgroups: 1. The patient with longstanding extensive unilateral disease who, for one reason or another, presents himself for treatment late in the course of his malady. In such a case constitutional symptoms may be of variable intensity but, because of the presence of cavity, cough and expectoration containing tubercle bacilli are almost always chronic and persistent. If the total area of cavitation exceeds four or five cm. in diameter, in spite of previous contraction of fibrous tissue, it is almost sure that complete healing will never occur naturally. If the history of chronic illness with intermittent symptoms is of long duration and these continue unabatingly after a short period of rest treatment, and if no contraindications exist, lung collapse isadvised; pneumothorax failing, thoracoplasty is resorted to.

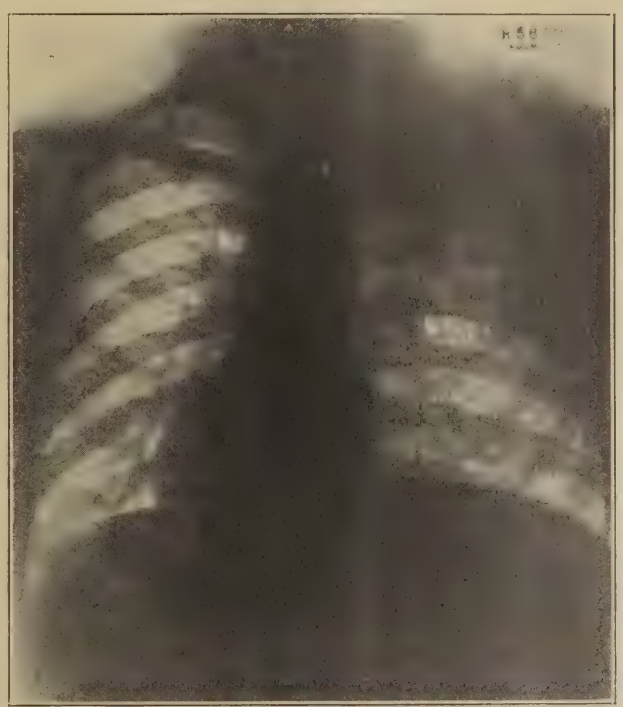

Fig. 3.—Dense fibrocavernous infiltration of long standing in the right upper lobe. Artificial pneumothorax attempted but ineffective (air pocket shown by ring shadow). Symptoms severe; general condition poor; complicating tuberculous laryngitis and enteritis of moderate severity; slight chronic nephritis. Operation offered as a last resort.

2. Cases in which a period of rest or sanatorium treatment has accomplished definite benefit, transforming a subacute or chronic ulcerative and caseous lesion into a fibrocavernous one, but in which symptoms, while less intense, reach a level at which they persist for months or years, and healing is seriously retarded or halted by mechanical barriers (such as large fibrous walled cavities) which are likely to yield only to lung collapse. In other words these cases arrive at the point occupied by subgroup 1. Earlier in their disease major surgery would perhaps have been risky but, having settled down to a state of established chronicity and fibrosis, they are now more suitable for the operation and the need for it is greater.

3. A group of cases in which constitutional symptoms are entirely absent or only intermittently present, but in which, because of the existence of unhealed cavities, there is chronic cough with expectoration. Such patients may go on for years working and without any serious handicap, but the menace of dissemination of the disease and such accidents as hemoptysis is constantly present. Usually lung collapse removes this menace, but whether the operation is to be done depends largely on the patient's attitude. In such cases the surgical risk is least.

4. Cases in which the contraction of massive fibrosis has caused such distortion and displacement of the heart and great vessels as to cause disabling circulatory symptoms. We have had this operation done in one case of this kind, the displacement having developed when artificial pneumothorax treatment was discontinued.

In addition to this group certain cases are met with in which the indications are not so clear cut. Healing and fibrosis may not be so well initiated, yet the need for lung collapse may be pressing and the results are not infrequently good. Here again opposing factors must be weighed and balanced, one against the other, and courage must support the conclusion which is drawn.

In certain instances of intractable hemoptysis, in which pneumothorax could not be induced, a thoracoplastic collapse has been employed. The risks of a posthemorrhagic bronchopneumonia are great.

Some authors lay particular emphasis on the development of bronchiectatic cavities in fibrous tuberculosis as an indication for thoracoplasty; these have practically the same significance as old tuberculous cavities.

In chronic tuberculosis empyema, secondary to natural or induced pneumothorax or simple pleural infection, with a draining sinus of the chest wall, thoracoplasty is often indicated, especially if a patent pleuropulmonary fistula persists. Thoracoplasty and thoracotomy produce a marked reduction of the empyema sac and of its drainage, and occasionally complete healing may occur.

Even though in certain cases pneumothorax treatment is partially successful one or two areas of cavitation may resist collapse and give rise to persistent cough and expectoration. A partial thoracoplasty may suffice to complete the collapse, but in some cases, because of the original extent of the pulmonary lesion, it is best never to allow reexpansion, and, therefore, to advise a complete thoracoplasty.

In the treatment of tuberculosis dogmatism has but a small place. Clinical judgment, born of experience, is a prime essential. In deciding the place of surgical procedures in the scheme of treatment, therefore, none but broad general principles can be laid down. Further experience will define these principles more clearly but always the results will vary with the training of the observer. At no point is it of more importance for the physician and the surgeon to cooperate. The former must study the cases, and determine when and to what degree col-

lapse and immobilization are needed; the latter, in addition to performing the operation, must decide on the type of operation which will best satisfy the needs.

I would warn especially against dissociating thoracoplasty or any similar measure from the broad scheme of phthisiotherapy, and calling it, singly, a treatment or a "cure" without doubt it has its place, but this place is as a mechanical aid in one limited section of the large field. This view is fully endorsed by Howard Lilienthal who has been the consulting and operating surgeon in most cases selected at the Loomis Sanatorium.

Like pneumothorax, thoracoplasty in itself does not remove the tuberculosis. The surgeon sets the stage for better healing; and then, under the supervision of the physician, the patient continues hygienic rest treatment until such healing is attained. To neglect this is to thwart the possible good effects of surgery.

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Resolution and Healing in Pulmonary Tuberculosis*

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It has long been accepted and it is still the orthodox belief of most clinicians and pathologists that healing of the lesions induced by the tubercle bacillus always means sclerosis or calcification, and even standard textbooks fail to mention the more radical view expressed recently by a few phthisiologists that specific tuberculous changes can resolve, heal and disappear completely. Krause (1), who has been vigorously defending this view, states: "that healed tubercle does frequently grave a permanent record in once infected tissues is sound pathological doctrine, but that it always does so is not borne out by facts, clinical or experimental." The complete absorption and disappearance of tubercles on the peritoneal surface is an established fact. The proof of perfect *restitutio ad integram* is demonstrated by carefully planned and serially prosecuted immunity experiments.

Gardner (2) in his admirable contribution Healing by Resolution in Experimental Tuberculosis, has demonstrated clearly with numerous microscopic illustrations that an attenuated tubercle bacillus, known in the Saranac Laboratory as R1 strain, is capable of producing lesions which progress to caseation, and that this caseation together with the accompanying proliferation of fixed tissue cells is then absorbed completely. "The healing process is one of resolution of which no trace remains at the site of the former lesion."

Unfortunately we have no method yet by means of which we could study microscopic tissue reactions and changes *in vivo*, but röntgenography is about the only method hitherto found which will give an accurate picture of the gross pathology taking place in the lungs during life. Amberson (3) states in his study of röntgenoscopic pathology in pulmonary tuberculosis that though the evidence is not microscopic, no other art can reveal much of the microscopic data than this form of biopsy affords, and by means of serial x ray pictures the mutations of destruction and repair may be depicted at desired intervals for months or years and the disease studied from its inception through all its pathological phases.

However, the significance of the study of röntgenographic pathology in pulmonary tuberculosis as well as the value of serial röntgenograms in correctly prognosticating such cases will be discussed fully in a subsequent contribution. The purpose of reporting and commenting on the following cases, indubitably tuberculous, as determined clinically, bacteriologically and röntgenographically, is to correct the rather rigid opinion of many a röntgenologist that one criterion of diagnosis of pulmonary tuberculosis is a certain fixity and persistence of shadow, and to bring out the fact that healing in tuberculosis does not always signify fibrosis or calcification, but that definite pulmonary tubercles may at times heal by resolution and disappear from skiagram in a comparatively short time.

Case I.—A presser, aged forty, was admitted to the sanatorium on July, 1922. His family history is irrelevant, and his past history is negative. He dated his present illness to about three months ago when he was taken ill suddenly with pain in the chest, slight pyrexia, cough and expectoration with frequently blood streaked sputum. He was confined to bed for about six weeks and began to recuperate gradually. His sputum was positive for tubercle bacilli on several examinations.

Physical examination of the chest on admission disclosed an extensive lesion in the entire left lung as well as in the upper lobe of the right lung. Röntgenographic examination at the same time showed bilateral dense infiltration of apices and first and second spaces, and moderately dense discrete infiltration throughout the major part of left lower lobe (Fig. 1). The patient did remarkably well under sanatorium treatment, his cough and expectoration subsided gradually and left him entirely after six months, he was apyretic all the time and gained in weight and strength persistently. His sputum became negative for tubercle bacilli about two months after admission, neither could the antiformin test of the sputum reveal any tubercle bacilli.

Physical examination of chest eight months after admission could disclose no adventitious sounds, except doubtful dry râles at the right apex. Röntgenoscopic examination showed marked clearing throughout, only slight haziness at right apex, and accentuation of lung markings. A radiogram taken

*From the Montefiore Hospital Bedford Sanatorium for Incipient Tuberculosis.

FIG. 1. FIG. 2

FIG. 1.—(Case I). Bilateral dense infiltration of upper lobes, and discrete infiltration throughout left lower lobe.

FIG. 2.—(Case I). Appearance one year later. Complete clearing of lesions, with only slight accentuation of lung markings.

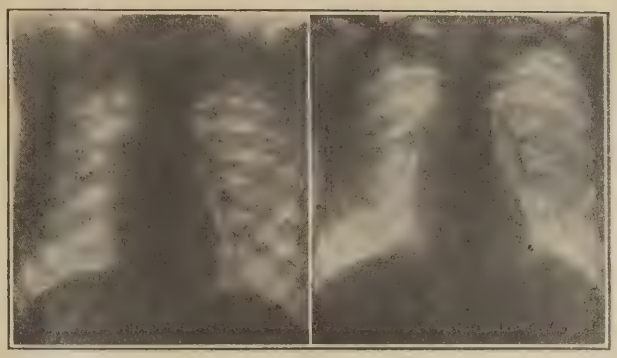

FIG. 3 FIG. 4

FIG. 3.—(Case II). Marked miliary stipplings of both lungs, the tubercles being more studded in the left middle lung field.

FIG. 4.—(Case II). Appearance two years later. Perfectly clear lung fields, only the hilum shadows appear increased with radiations in all directions.

a year later showed complete clearing of the old lesion, with only slight accentuation of lung markings (Fig. 2). Patient was symptomless all the time and attended to his work as usual.

CASE II.—A young man of twenty, admitted to the sanatorium October, 1922, with moderate pyrexia (100-100.6°), pain in chest, cough, expectoration and dyspnea. He gave a history of hemoptysis about three months prior to admission, after which high fever developed ranging from 101° to 103° which lasted about five weeks and began to subside gradually.

Physical examination of his chest on admission disclosed an extensive lesion in both upper lobes, more marked on right side, with also feeble breathing and moist râles at the right basal region.

The x ray plate (Fig. 3) taken on admission revealed marked miliary stipplings of both lungs, the tubercles being more studded in left middle lung field.

He did well under sanatorium treatment, his dyspnea disappeared, his cough and expectoration gradually diminished, and he gained in weight and strength. His sputum became negative for tubercle bacilli. Physical examination of his chest at this time showed practically no changes. A radiograph of his lungs taken at this time showed definite evidence of clearing of the collateral inflammation and the tubercles appeared more discrete.

Serial röntgenograms taken quite frequently showed the gradual disappearance and fading out of the tubercles from the plates; definite evidence of resolution. Fig. 4, an x ray plate taken about two years after the first one (Fig. 3), shows perfectly clear lung fields; only the hilum shadow appears increased with radiation into all directions.

CASE III.—An orderly, aged twenty-six, was working in the Bedford Sanatorium, but on account of fever, cough and expectoration had to give up work, and was put to bed. He gave a history of being subject to frequent colds and having a tendency to slight fever on exertion since 1915.

Physical examination at this time (March, 1919) disclosed a moderately advanced lesion of middle and upper lobes of right lung. His sputum was positive for tubercle bacilli. An x ray plate of his chest (Fig. 5) shows a considerable almost homogeneous density on a level with the second and fourth

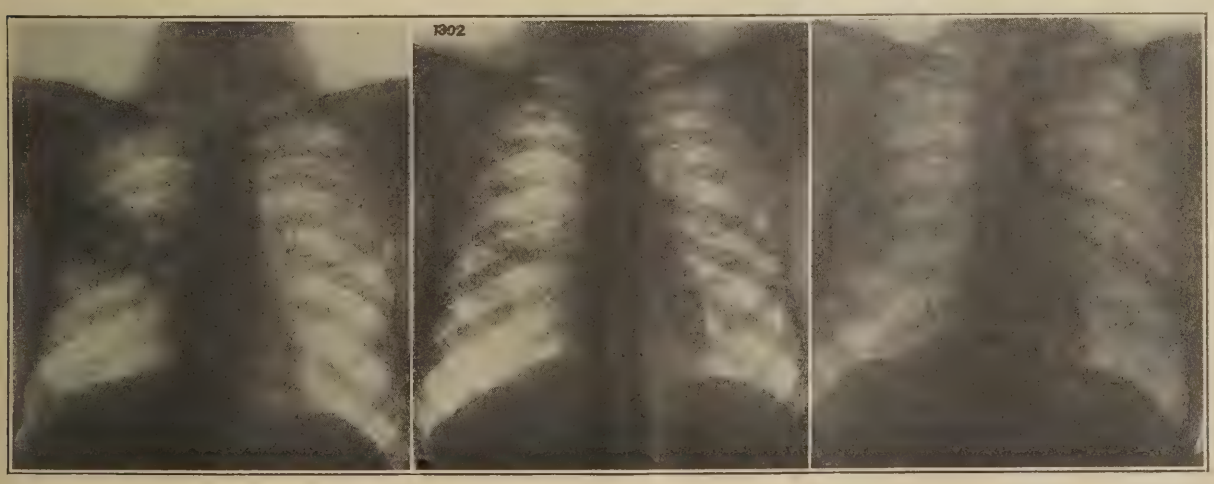

FIG. 5 FIG. 6 FIG. 7

FIG. 5.—(Case III). A considerable almost homogeneous dense shadow on level with second and fourth interspace of right hemothorax, a cavity about an inch in diameter at level of third rib near root.

FIG. 6.—(Case III). Appearance of lungs six months after initiation of pneumothorax. All the lobes of the right lung are seen partially collapsed.

FIG. 7.—(Case III). Three months after termination of pneumothorax therapy. The dense shadow seen in Fig. 5 has disappeared entirely leaving clear lungs, only in place of the cavity there is seen a small contracted scar.

interspaces of right hemothorax. A cavity about an inch in diameter is seen at level of third rib near root. There are also small scattered infiltrations at upper portion of lower lobe. The left lung shows increased root changes with radiations into all directions.

On account of persistence of symptoms and because of frequent small hemoptysis pneumothorax was induced into the right pleural cavity on April, 1919. His temperature began to fall, the general malaise disappeared, cough and expectoration diminished gradually, no blood streaks were seen in his sputum, and it became negative for tubercle bacilli. Patient did well under the treatment, and gained in weight and strength continually.

A röntgenogram (Fig. 6) taken on September, 1919, shows an effective right pneumothorax occupying the outer part of pleural cavity from apex to base. The individual lobes are clearly seen, the middle lobe being more collapsed than the other two which expand fairly well with each inspiratory movement.

Patient improved remarkably, became entirely symptomless, and returned to his work in about a year and a half. Ever since he has been working eight hours a day without any untoward results. Pneumothorax treatment was discontinued on February, 1923.

Physical examination of the chest about three months after the termination of the pneumothorax therapy revealed no adventitious sounds. Neither röntgenoscopy nor röntgenography showed any evidence of pneumothorax (Fig. 7). The dense shadow of the middle lobe has disappeared, leaving the lung entirely clear, only in place of the cavity there is seen a small contracted scar. There is no distortion of mediastinal structures, and both diaphragms function well.

COMMENT

All these cases gave a typical tuberculous symptomatology, exhibited definite physical findings of pulmonary tuberculosis, the bacteriological examinations of their sputum revealed tubercle bacilli for a long time, and they pursued a more or less stormy clinical course, but their pulmonary röntgenograms on admission differed widely in degree on involvement of the lungs, distribution of lesion, and mode of arrangement of these pathological changes. One showed dense infiltration of both upper lobes with discrete tubercles of left lower lobe, another exhibited evidence of miliary infiltration throughout both lungs, and a third disclosed caseation and cavitation of middle lobe and upper portion of basal lobe of right lung. What is more important, however, is the fact that all the lung skiagrams of these cases taken after the abatement of their subjective symptoms and the disappearance of the physical signs revealed no pulmonary pathology whatsoever, except increased lung markings,—a condition found in many nontuberculous cases. There occurred a complete resolution and disappearance of the previous tuberculous lesions.

All tuberculous cases who become clinically inactive and stop discharging tubercle bacilli in their sputum are known to the clinician as arrested cases; i. e., cases which have definite anatomical tuberculosis whose clinical activity has become arrested and has been rendered symptomless. Pathologically this means that the necrotic, caseous or infiltrative areas of the lung became fibrosed or calcified. Röntgenographically this is represented either by a homogenous clouding in a previously mottled area, or as a dense patch or even total opacity, if a pachypleuritis coexists, with retraction and distortion of mediastinal structures.

That this is the usual behavior of healed tuberculosis is almost axiomatic, but those who have done repeated physical and radioscopic examinations of tuberculous patients in sanatoria get "surprises" not infrequently; the shadow instead of becoming more dense and conspicuous, is gradually fading out of the x ray picture and may disappear entirely.

Furthermore, not always does the entire lung clear up, but while one patch may become persistently denser—indicative of fibrosis taking place, another density at the same time and in the same lung is diminishing gradually and finally disappears entirely from the radiograph. Whether this is due to a local immunity of the tissue or to a general reaction which brings about resolution instead of fibrosis can only be conjectured. Suffice it to state, however, that resolution in pulmonary tuberculosis does take place occasionally and Case I. brings it out clearly. There was a massive confluent tuberculization of both upper lobes with discrete tubercles throughout the left lung, and they all disappeared within a year or so leaving no trace of themselves, at least as far as we can determine röntgenographically.

The röntgenographic study of the case of miliary pulmonary tuberculosis is of marked clinical interest. The gravity of miliary tuberculosis is too well known by every clinician, and it almost always means death. However, recently a type of chronic miliary pulmonary tuberculosis has been described by Bierman (4), Stivelman and Hennell (5), where the disease ran a chronic course, and radiographically they found that the miliary tubercles went through all the gamut of destruction and repair by fibrosis or calcification. Krause (1) mentions a case of a woman who became acutely ill and an x ray examination brought to light miliary stippling of the lung. The woman recovered and with convalescence all shadows of pulmonary miliary involvement disappeared. If serial röntgenography were practised more frequently and persistently, cases of complete recovery from miliary pulmonary tuberculosis with resolution and disappearance of the tubercles would probably cease to be a medical rarity.

CASE III, where the patient was treated with artificial pneumothorax for about four years, deserves particular attention because it might throw definite light on the mechanism of resolution and clearing. In my work, The Classification of Artificial Pneumothoraces and Their Corresponding Clinical Value (6), I pointed out that in properly selected cases of early pulmonary tuberculosis treated by artificial pneumothorax of the expansile type, the patients may eventually recover with complete anatomical and physiological recovery of the lung. Case III is a striking example of such a recovery, as it is disclosed by the röntgenograms taken prior to the induction of pneumothorax, during the course of the treatment and after the completion of the treatment. A comparison of the x ray plates in Figs. 5 and 7

shows distinctly that the massive infiltration of the middle and lower lobes has cleared up and disappeared entirely. Of course, in place of the small cavity noticed on Fig. 5 one can see a narrow scar on Fig. 7, as we would naturally expect that the only way for a cavity to heal is by fibrosis and scarring. In this case the pneumothorax promoted healing by approximating the walls of the cavity, and served the same purpose as the sutures of a surgical wound, i. e., brought about a more rapid healing by primary intention. But the outstanding feature of this case is the resolution and complete disappearance of the massive caseous areas, at least macroscopically as far as we can detect by x rays.

It is not the purpose of this article to explain how resolution is brought about in pulmonary tuberculosis, but without going into details of the mode of production of tubercle antibodies whose exact nature is yet little understood, one could theorize that at the time of initiation of pneumothorax there might have existed an equilibrium between the toxic elements and their antibodies. By introducing gas into the pleural cavity and collapsing the lung we diminish the diseased area, squeeze out large masses of caseous material which is being expectorated, and with it we naturally eliminate a large amount of toxins. It is this elimination of toxins that brings about the immediate amelioration of symptoms to the patient, as evidenced by the fall in temperature, disappearance of general malaise, improved appetite, etc. But while the toxic elements are greatly diminished, the number of the antibodies that have already been formed against these toxins, remain the same as before, and consequently outbalance greatly the remaining toxins. Is it not possible that this overabundance of antibodies prevents a further proliferative cellular reaction in the lungs, but instead brings about resolution? This theory is inadequate in explaining resolution in cases of pulmonary tuberculosis not treated with pneumothorax, unless we hypothesize further that even in those cases an overabundance of antibodies was being formed in some way or other. No doubt more than one factor plays its rôle in the process of resolution; the character of the infecting bacillus and its manner of infecting, the native and acquired resistance of the host, the local and general immunity as well as the status and condition of host at time of infection—all these forces help to shape the final result.

Of course, it is for the experimentalist to furnish the true clue and explanation of the phenomenon of resolution in tuberculosis, but the impression is gained that it is in the exudative type of pulmonary tuberculosis, i. e., where the inflammatory features predominate over the proliferative ones that resolution may take place. Gardner (2) sums up the process of resolution in experimental pulmonary tuberculosis as follows: "The bacilli are killed by the body fluids, the caseous matter is invaded and removed by mononuclear and polynuclear cells; and the proliferated cell masses at the periphery are absorbed even as granulation tissue is absorbed after any other infectious process," but whether resolution can take place also in human pulmonary tuberculosis he is not ready to state. Krause, however, is of the opinion that resolution may go on irrespective of high or low invasiveness of germ.

There is no doubt that closer observation of pulmonary tubercles would prove that they are wiped out completely in many more instances than we are now accustomed to think likely. Of course, we speak here of the gross visible change that can be detected röntgenographically, but it is not improbable that there remains a microscopic record in such diseased tissue. Gardner found that the only signs of the previous tubercles were aggregations of lymphoid masses, but these later failed to infect guineapigs when injected subcutaneously. Miller (7) found that the human lung of the adult contains much more lymphoid tissue than that of the child. Is it not possible that this increased intrapulmonary lymphoid tissue is a remainder of previous tuberculous infection which subsided without leaving any visible traces of its former activity?

Unfortunately we cannot yet make a prognosis from one x ray plate as to the outcome of the disease, just as it is impossible in most instances to tell from one röntgenogram whether or not the disease is active or quiescent. Serial röntgenography should be practised more frequently as it is the only reliable method by means of which we can study the mutations of pulmonary shadows during life. It does bring out the fact clearly that fixity and persistence of the x ray shadow is not a necessary criterion for pulmonary tuberculosis, and that definite tubercles may at times, instead of becoming sclerosed or calcified, undergo resolution and disappear from the tissue without leaving any macroscopic trace that could be determined by x rays.

SUMMARY AND CONCLUSIONS

1. The pathological doctrine that healing of the lesions induced by the tubercle bacillus always signifies sclerosis or calcification ought to be revised somewhat; in a small number of such cases at least healing had been noticed to take place by resolution.

2. Cases of pulmonary tuberculosis are reported and a number of their serial röntgenograms are presented to demonstrate the fact that definite tuberculous shadows may fade out gradually and disappear entirely from the x ray plates.

3. The clearing and disappearance of tuberculous lesions may take place in miliary tuberculosis as well as in other types of pulmonary tuberculosis. Physical examination is of little value in detecting such changes, only by repeated röntgenographic observations can a correct prognosis be made.

4. These facts do not substantiate the opinion held by many röntgenologists that one criterion of diagnosis of tuberculosis is a certain fixity and persistence of shadow; it is the author's belief that a more systematic serial röntgenographic study of pulmonary tuberculosis would disclose a much larger percentage of instances of complete resolution, clearing and disappearance of tubercles.

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Neuropsychiatry in Tuberculosis

A Survey of Two Hundred Patients

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Albuquerque Sanatorium, New Mexico

Experience has shown that in chronic organic disease, functional nervous disorders bear a definite relation to the progress of the disease and in a large number of cases probably spell the difference between attaining a cure and terminating the patient's life. Functional nervous disease occupies a position today so important that we cannot ignore its relation to a disease as chronic as tuberculosis. Patients who present themselves for treatment complaining of being nervous and showing any of the earmarks of a definite neurosis, certainly invite our attention to a matter vital to their welfare. The psychiatrist for many years past has been able to demonstrate repeatedly that frank neurotics suffering from organic disease symptoms have been relieved and organic conditions cured in the course of and with the aid of psychotherapy. This has led to a study of the relation between organic and functional ailments. The abnormal psychological mechanisms observed in a large number of tuberculous patients led me to study them with a view of determining the frequency with which these conditions are met and what influence they have on the progress of the disease.

It might be stated here that a great number of psychoneurotics going through the hands of the tuberculosis specialists are not suffering from tuberculosis. They present themselves with symptoms resembling tuberculosis, but prove eventually to be entirely free from clinical tuberculosis. The phthisiophobe, on close study, often proves to be a hysteric, a hypochondriac, a psychasthenic, or a psychopathic personality, seeking relief or refuge behind this often convenient smoke screen. The neurasthenic, the hysteric, the mild precox, or the person suffering from an anxiety neurosis can present symptoms characteristic of tuberculosis, such as loss of weight, weakness, low grade temperature, vague gastrointestinal disturbances. If he gives a history of familial tuberculosis, he at once falls under strong suspicion. In addition, the chest may reveal some changes due either to an old fibrotic lesion or an acute bronchial condition and therefore present a picture which resembles incipient phthisis so closely that only careful study can differentiate. Our experience leads us to believe that many of the patients complaining of symptoms which might be considered as due to tuberculosis are either frank neurotics or individuals suffering from endocrine disorders. No doubt some of these are admitted to sanatoria for tuberculosis and treated as tuberculous with good results. One can readily see that in institutions of this kind where no member of the staff has had psychiatric training and differentiation between functional nervous disease and clinical tuberculosis is not made, the statistics as to improvements, arrests, etc., would be incorrect and indicate an efficacy in the treatment of tuberculosis which does not in reality exist.

However, the damage done in so many of these patients designated as tuberculous is that the horror of tuberculosis and the thought that he is suffering from it, constitutes a psychic trauma to the psychoneurotic and fixates so many symptoms that later psychiatric treatment becomes most difficult. This is the type of patient who will wander from one consultation room to another seeking confirmation of the diagnosis and thereby fixating the neurosis more and more. In some cases it is a question if an individual of this type and in these circumstances, originally free from clinical tuberculosis, does not eventually break down with active disease as a result of his neurosis. The cause of tuberculosis being somewhat regarded as that vague and indefinite thing "lowered resistance" certainly leaves room to suppose that an individual whose organic function is impaired through psychopathology is liable to infectious disease and that tuberculosis can make its appearance as the result of this. We meet patients in whom a neurosis has existed since childhood and all their reactions have led towards chronic invalidism. Minor organic disease having made its appearance and having been enlarged upon, they came to regard themselves as being "delicate," having "weak lungs," "lowered resistance" and have expected to break down with some serious disease. (These people seem to have a morbid satisfaction that something has come to pass for which they have waited many years.)

The necessary restraint and careful living imposed upon the tuberculous in all stages no doubt tends to bring about a chronic invalid reaction which borders on, if not actually constitutes, a neurosis. For the purpose of this study, however, that condition has been left out unless it was part of the symptom picture of the psychopathology. The mere fact that a patient at times complains of nervousness, sleeplessness, palpitation, etc., does not, of course, constitute a neurosis. It is only when these symptoms predominate the patient's reactions and cut into his personality, forming a distinct handicap, that they must be taken into consideration. Even though months and years spent in bed is an abnormal environment when compared to healthy pursuits, there is such a thing as an individual making an adjustment to this environment and keeping the personality intact. The dissatisfied chronic kicker, who is constantly beset with fears, worries and morbid ruminations certainly stands out from the normal. He it is that needs investigation and treatment which may not always conform to the accepted routine. It is this type of individual who may have to be gotten out of bed and allowed some exercise when his physical condition would contraindicate such a procedure. This cannot be and is not always practised in the larger institutions on account of the effect on the general discipline, but the smaller, and especially private institutions are not modeling themselves along lines of rigid systems but are studying their patients' individual requirements and treating them accordingly.

By this we do not mean that because an individual is neurotic he should be gotten out of bed and allowed to follow his inclinations. His condition must be carefully studied, psychotherapy instituted and his reactions guided as much as possible into normal channels.

NERVOUS MANIFESTATIONS

In a number of patients, weakness, or rather exhaustion, is a predominating symptom, and even though their tuberculosis is quiescent or arrested, they stick to their beds. An order to exercise is met with stubborn resistance and they remain in bed indefinitely. The greatest and by far the most common factor met in our series is the opposite. They have an incessant urge to be up and about and are dissatisfied with their surroundings. They are tired of staying in bed. They have heard of someone who was much sicker than they are who did not stay in bed and is now a "cure." The old idea of exercising regardless of temperature and pulse suits them and they demand to be treated along those lines. They have read all they could find on tuberculosis and unless the physician agrees with their ideas of diet, medication, etc., he does not know what he is doing and they desire to make a change. This is also accompanied by the fear that staying in bed will bring on weakness, poor circulation, sleeplessness, loss of appetite, and a myriad of other symptoms. Analysis in these individuals reveals the usual sex complexes. Impotence, real and imaginary, is the underlying factor in the majority of instances.

These manifestations have been roughly classified as restlessness for the purpose of this paper. These people certainly require the most intensive course of suggestion, persuasion and reeducation. Often tuberculous patients change climate constantly, not because they are really doing so badly in one, but because their personality is inadequate at one place, and they always entertain the hope that some other resort town might measure up. Patients of this type will complain of all the disagreeable factors—real and imaginary—of the other town and the other institution. They constantly change physicians and have usually exhausted the gamut of quack remedies always so prevalent for the cure of tuberculosis. They are certainly handicapped by their neuroses and regardless of the most skillful medical measures directed towards the disease, they frequently do not get along and lose the fight against odds, already large, for the most sane of individuals.

In this study an attempt has been made to classify as neurotic only those persons who manifest the major symptoms of a distinct psychoneurosis to the extent that it constitutes a handicap in treating the tuberculosis and interferes with the patient's welfare. As pointed out above, there is probably no patient suffering from a disease as long drawn out as tuberculosis who does not at times manifest symptoms bordering on the abnormal as far as his psychic reactions are concerned. In the normal individual, these symptoms are easily relieved by explanation and interpretation. The psychoneurotic, however, does not take to these explanations and oftentimes harm is done by trying to show him the error of his reasoning by being concise and brief. It requires a great deal of time and effort on the part of the physician to convince these patients that a neurosis may exist in addition to organic disease and that abnormal mental reactions influence organic function.

The series of patients here studied was taken in the order in which they occurred in the files of our institution. They represent, we believe, a cross section of patients as they are admitted for treatment in the average sanatorium, at least in the West. There is reason to suppose that the health resort often attracts a type of individuals somewhat afflicted with the *Wanderlust* and that he is seeking new scenes rather than actually expecting benefit from a different climate. This type of individual is, of course, not normal and no doubt we have him occurring in this series to the extent that our total number of psychoneurotics is slightly raised by his presence.

AGE, DURATION, AND RACE

In this series, the average age of the patients was thirty years and seven months. Duration of the disease when they came under our observation varied from one month to twenty-six years, with an average duration of four years, six and a half months. There were one hundred and sixty native born Americans, eight Germans, eight Jews, seven Swedes, three Irish, two Greeks, two Indians, two Bohemians, one Swiss, one Austrian, two Canadians, one English, one Scotch, one Syrian and one Norwegian.

ORGANIC FACTORS

Other organic factors encountered in these two hundred patients showed ten to have chronic malaria, eight syphilis uncomplicated, one syphilis with gonorrhea, one syphilis with diabetes, and one syphilis with aneurysm, which was the causative factor in his death. Three had mitral stenosis, one a massive secondary mixed infection, one a nontuberculous pyelitis and one a colitis of rather severe degree. Twenty goitres were present and three patients showed pronounced pituitary involvement.

PSYCHONEUROSES AND PSYCHOSES

Of the two hundred patients studied, ninety-four, or forty-seven per cent., were suffering from a definite psychoneurosis or psychosis. Fifty-two or fifty-five and five tenths per cent., of these ninety-four had hysteria; twenty-six, or twenty-seven and three tenths per cent., neurasthenia; five, or five and three tenths per cent., were precoxes; five, or five and three tenths per cent. were constitutional psychopathic states; two, or two and one tenth per cent., were hypochondriacs; one, or one and one tenth per cent., manic depressive insanity of the depressed type; one, or one and one tenth per cent., psychasthenic; two, or two and one tenth per cent., had general paresis; one, or one and one tenth per cent., manifested presenility. In the hysterics, five were complicated with large anxiety elements and one with marked inferiority. Two of the neurasthenics possessed anxiety elements. Two of the five patients with dementia precox were of the hebephrenic type, one was a simple precox and two showed precox personalities.

SYMPTOMS

The restlessness described above was the prominent symptom in sixty-three, or sixty-eight and eight tenths per cent., of the patients showing neuroses.

Insomnia, the next most frequent symptom, occurred in fifty, or fifty-three and two tenths per cent. Vague gastrointestinal symptoms which could not be explained on an organic basis occurred in twenty-five, or twenty-six and six tenths per cent. Anxiety to the extent that it constituted a neurotic symptom occurred in fifteen, or fifteen and nine tenths per cent. Instability, defined as an unstable personality with emotional upsets, inadequate personality, and states bordering on the hysterical, was present in thirteen, or thirteen and eight tenths per cent. Weakness, which was not due to organic disease or not adequately explained by it, was present in eight, or eight and five tenths per cent. Worry occurred in twelve, or twelve and eight tenths per cent. Palpitation, for which there was no explanation, other than neurotic, was a prominent symptom in five of the patients; in three apprehension was a big factor; irritability in three; waywardness in three; mental depression in seven; pathological fear in three; stuttering was present in three; two were mildly deluded; very marked inferiority was present in one; aboulia in two; asthma on an entirely neurotic basis was present in one; pathological forgetfulness in one; exhaustion in one; ideas of grandeur in one.

TUBERCULOSIS CLASSIFICATION

The one hundred and six normal patients came under the following classification: Far advanced, fifty-four, or fifty-one and four tenths per cent.; moderately advanced, thirty-two, or thirty and four tenths per cent.; incipient, nineteen, or eighteen per cent., and one had a tuberculous hip. Of the psychiatric patients, fifty-six, or fifty-nine and two tenths per cent., were far advanced; twenty-two, or twenty-three and four tenths per cent., moderately advanced; sixteen, or seventeen per cent., incipient. Roughly, the stage of the disease was the same so that the far advanced tuberculous is not necessarily more liable to manifest a psychoneurosis. When we consider that the average duration of the disease in the two hundred patients was four years, six and a half months, it would lead one to suppose that on the whole the neurotics had ample time to fixate their symptoms and let them interfere with the progress.

PROGRESS OF THE PATIENTS

Of the one hundred and six normals, seventy, or sixty-six per cent., made good progress during our observation. Nineteen, or seventeen and nine tenths per cent., are known to be dead; in sixteen, or fifteen per cent., the progress was only fair; one disappeared from our observation and his fate is unknown. In the neuropsychiatric group, twenty-six, or twenty-seven and six tenths per cent., are known to be dead; twenty, or twenty-one and two tenths per cent., made good progress; twenty-eight, or twenty-nine and eight tenths per cent., made fair progress; very poor progress, besides those that died, was seen in fourteen, or fourteen and eight tenths per cent.; in six, or six and one tenth per cent, it is very questionable whether they are alive. Of the forty-seven hysterics with no concomitants, sixteen made fair progress, ten are known to be dead; nine got along well, eight, besides those that died, made very poor progress, and in two cases the fate is unknown. In the uncomplicated neurasthenic group, eight are known to be dead, six got along well, in seven the progress was fair, one did very poorly, and two are lost track of with questionable outcome. In hysteria with concomitants—one in the anxiety group died, two got along well, one fairly well, and one very poorly. The patient with infantilism and hysteria did very well. The hysteric with very marked inferiority did badly and her fate is not known, but she is probably dead. In the precox group, the three fully developed precoxes died, one being a suicide. In the constitutional psychopathic state group, two died, one's progress was good, one fairly good, and one very poor. The two hypochondriacs progressed fairly well. The two with general paresis did very poorly. The one in the presenile state we have lost track of and her outcome is very doubtful. The patient with manic depression insanity died. The psychosthenic progressed well.

PSYCHOTHERAPY

Psychotherapy was employed in forty-eight of the patients. Some of these patients were located outside of the institution and it was very difficult to treat them satisfactorily. A complicating factor so often met in this series was the presence of members of the families accompanying the patients and being in constant attendance upon them. This handicaps one in attempting to treat by isolation, which is, of course, good practice in these cases. Nevertheless, markedly favorable results were obtained in at least twenty-seven of these patients. This is considered well worth while and leads one to believe that intensive psychotherapy in proper surroundings is a great aid in treating the tuberculous.

This paper is a plea for men in tuberculosis sanatoria to familarize themselves with neuropsychiatry and undertake the study of the psychologic makeup of every patient. The successful men in practice many times possess keen insight into the patient's psychobiological makeup and practice psychotherapy instinctively. This probably constitutes the greatest weapon outside of specific therapy in the physician's armamentarium when he is confronted with organic disease. However, not all are blessed with this gift but training along neuropsychiatric lines will fill this long felt need.

CONCLUSIONS

1. Functional nervous disease occurs with great frequency among the tuberculous.

2. The disturbances in bodily function by a neuropsychiatric state can no doubt constitute a predisposing factor in tuberculosis.

3. Psychoneurotics are sometimes wrongly diagnosed as tuberculous and find their way into institutions for the treatment of tuberculosis.

4. It is a question as to just how much of a rôle these patients play in statistics reported from institutions where neuropsychiatric diseases are not recognized.

5. Neuropsychiatric diagnoses in patients with tuberculosis and proper psychiatric treatment are a definite help in the treatment of their tuberculosis.

6. The psychoneurotic has a definitely worse prognosis for his tuberculosis than the individual with approximately normal personality.

Historical Medicine

A Minor De Quincey

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INTRODUCTION

In 1837, sixteen years after the master essayist, De Quincey, had produced the *Confessions of an English Opium Eater,* Fitz Hugh Ludlow was born in Poughkeepsie, N. Y. Upon graduation from the Union College at Schenectady at nineteen, he immediately entered into the sphere of letters. *The Hasheesh Eater,* subtitled *Passages from the Life of a Pythagorean,* written while he was a student and published in 1857 in Putnam's magazine, promptly earned for him a wide recognition.

During the following years he held various literary positions, among them that of editor of *Vanity Fair* from 1858 to 1860, correspondent for two successive years with the *New York World,* the *Evening Post* and the *Commercial Advertiser,* and, for a time, dramatic, musical and art critic for the *Home Journal.* He also wrote steadily for *Harper's Monthly,* chiefly short stories, and was one of the leading contributors to the *Northern Lights,* a Boston periodical. "What Shall They Do To Be Saved?" appeared in *Harper's Monthly* in 1867 and "The Opium Habit" in 1868. Two years later he died in Geneva, Switzerland, a victim of the selfsame habit he so strenuously inveighed against.

The writings of Ludlow show him to have possessed a keen sense of humor, a remarkable insight into character, and a very refined feeling and taste. But apart from the fact that on at least three occasions he not merely touched upon but delved deeply into the vagaries and vicissitudes of the habit forming drugs, opium and hasheesh, little is known of his associations with the drugs themselves or how they affected his life and career. The following summary of his impassioned indictment against the treacherous poppy seed may perhaps shed some light on this matter.

"WHAT SHALL THEY DO TO BE SAVED?"

"God seems to help a man in getting out of every difficulty but opium. There you have to CLAW *your way out over redhot coals on your hands and knees and drag yourself by main strength through the burning dungeon bars."*

In this intense and vivid discourse are presented, in a masterful fashion, "a few considerations regarding the action of opium on the human system while living, and the peculiar methods by which the drug encompasses its death." The author assumes the rôle of a physician, pretending that he is treating a friend who is an extreme addict. As he sketches the rapid stages in the downfall of the pitiful victim, he makes forceful and elucidating comments on the various features of the pernicious habit.

One is inclined, however, to the suspicion that Ludlow has here recorded his own personal adventures with the drug that he calls vindictively "a corrosion and paralysis of all the noblest forms of life." The impassioned tone and pathetic strain that resound throughout, the vigorous and indisputably realistic descriptions that bespeak first hand knowledge, capped with the fact above mentioned that he died at thirty-three of the opium habit, afford ample ground for such an assumption. For it is not an uncommon occurrence for men of letters (and Ludlow was a capable and natural writer) to discuss the results of their intimate tamperings with the imagination stirring but disaster wreaking drug.

"There are certain men," he begins, "to whom opium is as fire to tow." His friend was the case in point. His first contact with the drug was a cursory one early in life. But it was not until he became afflicted with an attack of inflammation of the cornea that his indulgence began to any intensity. A doctor whom he had consulted eight years previously had prescribed, in addition to a local application to the eye, internal doses of "M'Munn's elixir" to quell the excruciating pain. This remedy was a prevailing quack preparation, allied chemically to tincture of laudanum.

When he emerged from the dark room at the end of a month and his bandages were removed, he had consumed twenty ounces of the elixir. He then began taking it at short intervals, totaling fifty drops daily, but within a month this was of necessity increased to an ounce a day. When the eye was completely healed he stopped the use of the anodyne—but not for long. For "he had not forgotten the sweet dissolving views at midnight, the great achievements at noonday, the heavenly sense of selfreliance which dare go anywhere, say anything, attempt anything in the world. He had not forgotten the nonchalance under slight, the serenity in pain, the apathy to sorrow, which for one month set him calm as Buddha in the temple splendors of his darkened room. He had not forgotten that the only perfect peace he had ever experienced was there, and he remembered that peace as something which seemed to blend all the assuaged passion and confirmed dignity of old age with that energy of high emprise which thrills the nerves of manhood."

And so at the age of forty he found himself an habitué of eight years' standing. Whenever the world went wrong with him he resorted to M'Munn's. It soon became imperative that he increase the dose to keep his appetite satisfied. Yet even then the elixir finally proved inefficient, so he changed to laudanum, "which contains the full native vigor of the drug unmodified." But this, as well as gum opium, opium pills and opium powder, which he likewise tasted, nauseated him, and he was thus ultimately "driven to that form of exhibi-

tion which sooner or later naturally strikes every opium eater as the most portable, energetic, and instantaneous—morphine or one of its salts."

With time his daily consumption ranged from twelve to twenty grains, one half immediately after rising, the rest just about sundown. Physically at this period his body was in no way impaired, but he came to the conclusion that he "*must* emancipate himself, because opium eating was a horrible mental bondage."

The pleasures and dubious joys of the addiction were waning. The victim found that "the image graving and project building characteristic of opium, which comes on with a sense of general radiation from the epigastrium about a quarter of an hour after the dose, had not yet so entirely disappeared from its effect on him, as it does at a later stage of the indulgence. But instead of being an instigation to the delightful reveries which ensued on his earlier doses, this peculiarity was now as an executioner's knout in the hands of remorse. He was daily and nightly haunted by plans and pictures whose feverish unreal beauty he remembered having seen through a hundred times. Those Fata Morgana plans, should he again waste on them the efforts of construction? The result had been a chaos of ineffectual days. Those pictures, why were they brought to mock him? Were they not horrible impossibilities? Were they not, through the paralysis of his executive faculties, mere startling likenesses of disappointment? In his opium dreams he had seen his own ships on the sea; commerce bustling in his warehouse; money overflowing in his bank. . . . How pleasurably he had once perceived all these possible joys and powers! How undeludedly he now saw their improbable execution!"

But alas for good intentions! The physical hold of the drug by this time was too strong—and "the spiritual thralldom was his hourly misery." Under the hand of the doctor the doses were gradually reduced, until he was taking only one half a grain a day. But nocturnal paroxysms necessitated the restoration of the original amount, for "when a man has used opium for a long time, the condition of the brain supervening on his deprivation of the drug for a period of twenty-four hours is such as very frequently to render him suicidal."

The power of the will and grim determination were handicapped from the start by the strenuous hold of the drug on the mind. It had long passed the stage of "I can" and "I will." And this is what Ludlow says on the matter of the blame: "Whatever may have been the patient's responsibility in *beginning* the use of narcotics or stimulants (and I usually find, in the case of opium eaters, that its degree has been very small, indeed, therapeutic use often fixing the habit before the patient has convalesced far enough even to know what he is taking), habituation invariably tends to reduce the man to the *automatic* plane, in which the will returns wholly to the tutelage of sensation and emotion, as it was in infancy; while all the intellectual, save memory, and the most noble and imperishable among the moral faculties may survive this disorganization for years, standing erect above the remainder of a personality defrauded of its completion to show what a great and beautiful house might have been built on such strong and shapely pillars."

The denial of the drug brought on an agony "which took his actions out of voluntary control, eclipsing the higher ideals and heroisms of his imagination at once, and reducing him to that automatic plane in which the nervous system issues and enforces only those edicts which are counseled by pure animal selfpreservation." The only recourse left was to send him to a water cure where absolute deprivation could be maintained. He was accordingly starved of his Nepenthe for ninety days during which time he knew no normal sleep. He fell into a semiconscious state and for the last fifty days sat constantly bolt upright in bed.

At the end of the treatment he was almost prostrate, in intense agony, and mentally confused. The prognosis was very gloomy, so the baneful drug was restored to him, for further struggle meant sure death. The patient's final injunction was heartrending: "It is almost like Dives asking for a messenger to his brethren; but tell them, tell *all young men* what it is, 'that they come not into this torment.'"

Is there then no hope? Must the note be always pessimistic? Not always, for "over the opium eater's coffin, at least, thank God! a wife and a sister can stop weeping and say, 'He's free.'"

The course on the road upward, Ludlow says further in discussing the attempted cure, is very perilous. "The records of fatal lesion, mechanical childbirth, cancerous afflictions, the stake itself, contain no greater tortures than a confirmed opium eater experiences in getting free." The recovery is to take weeks and months; "who is sufficient for this long, *long* pull?"

Twenty-four hours after the deprivation, the torments begin. First there is a peculiar "corded and tympanic tightness about the epigastrium . . . then a feverish condition of the brain which sometimes amounts to absolute phantasia." Following this occur periods of increasing excitement marked off by heavy sleep, which after each interval "grows fuller of tremendous dreams, and breaks up with a more intensely irritable waking." In forty-eight hours the heavy sleep disappears. "Every nerve in the entire frame now suddenly awakens with such a spasm of revivification that no parallel agony to that at this stage can be adduced." This horrible state continues for a week with neither lull nor exhaustion.

A pronounced and significant phenomenon, we are told, has now supervened. After the third day, "profuse and increasingly acrid bilious diarrhea occurs, which must not be checked if diagnosis has revealed sufficient constitutional vigor. . . . The spontaneous termination of the diarrhea will indicate that the effete matters we must remove have been eliminated." Soon after this there is a mitigation of the pain, followed by great debility.

Subjectively, the agony of the struggle is very pronounced. There is a "dull, aching sensation between the shoulders and in the region of the loins. . . . The most intense gastric irritability appears in the form of an aggravation of the tympanic tightness, corrosive acid eructations, heartburn, water-

brash, and a peculiar sensation, as painful as it is indescribable, of selfconsciousnes in the whole upper part of the digestive canal." Concomitant with the gastric sufferings, there is a neuralgic pain which spreads down the extremities from a centre between the kidneys, through the trunk, and through the "whole medullary substance of the brain, itself." Comparing the pain with that of tic douloureaux, he says that it has periods of exacerbations like the tic, but none of its continuous repose; like it, it fluctuates, but affects the entire body rather than a single area.

To heap coals on the blazing fire, there is a torturing hyperesthesia. The slightest touch hurts, the least jar aggravates, as it does a martyr to acute rheumatism. The very hair and nails feel sore, and the whole surface of the skin suffers from cold air or water "like the lips of a wound."

If bodily punishment were the entire mete, the treatment might perhaps be endured. Yet "the totality of the experience is only conceivable by adding this physical torture to a mental anguish which even the Oriental pencil of De Quincey has but feebly painted; an anguish which slays the will, yet leaves the soul conscious of its murder; which utterly blots out hope, and either paralyzes the reasoning faculties which might suggest encouragements, or deadens the emotional nature to them as thoroughly as though they were not perceived; an anguish which sometimes includes just, but always a vast amount of unjust selfreproach, which brings every failure and inconsistency, every misfortune or sin of a man's life as clearly before his face as on the day he was first mortified or degraded by it—before his face, not in one terrible dream, which is once for all over with the sunrise, but as haunting ghosts, made out by the feverish eyes of the soul, down to the minutest details of ghastliness, and never leaving the side of the rack in which he lies for a moment of dark or daylight, 'til sleep, at the end of the month, first drops out heaven on his agony."

What shall the doctor do to save them? There are several lines to follow. "When the most powerful alleviative known to medical science has bestowed its last Judas kiss which is necessary to emasculate its victim, and, sure of its prey, substitutes stabbing for blandishment, what alleviative, stronger than the strongest, shall soothe such a doom? I may give chloroform. I always do in the denouement of bad cases."

That, of course, is the ultrahumane method. The doctor might, our author tells us, speak as follows to the average case of ten years' duration:

"Sir, the chances are entirely against you, and the possession of a powerfully enduring constitution, if you have it, forms a decided offset in your favor."

He then advises immediate entrance upon the road of selfabnegation. If the case is hopeless from the start he may elaborate to this effect:

"You have either suffered a disorganization of irreproducible membranes, or you have deposited so much improper material in your tissues that your life is not consistent with the protracted pain of removing it. One by one, you have paralyzed all the excretory functions of the body. Opium, aiming at all those functions for their death, first attacked the kidneys, and with your experimental doses you experienced a slight excess of dysuria. As you went on, the same action, progressively paralytic to organic life, involved the liver. Flatulence, distress at the epigastrium, irregularity of the bowels, indicated a spasmodic performance of the liver's work which showed it to be under high nervous excitement. Your mouth became dry through a cessation of the salivary discharge. Your lachrymal duct was parched and your eye began to have an *arid* look in addition to the dullness produced by opiate contraction of the pupil.

"All this time you continued to absorb an agent which directly acts for what, by a paradox, may be called fatal conservation of the tissue. Whether through its complexly burned nitrogen, carbon or both . . . the drug has starved the fires of your whole system. . . . You have sealed up all but a single excretory passage—the pores of the skin, and when that gives out, your body shall be shut up like an entirely choked chimney.

"The condition both of your nervous system and your stomach indicate that you must always take some anodyne to avoid torture, and *your* only anodyne is opium. The rest of your life must be spent in keeping comfortable, not in being happy."

A closing plea Ludlow makes anent the insidious drug which "sings to every sense a lulling song from which it may not awake for years, but wakes a slave":

"Would to God that every young person could stand for a single hour by the victim's bedside before Life's responsibilities have become the sentinels and Habit the jailer of the Will."

Buried though they are in the dust and files of nearly seventy years, these words carry today a portentous meaning. "What Shall They Do To Be Saved?" is withal a living, a truthful, and a highly authentic document.

513 Irving Avenue.

Hippocrates and His Temple of Health.—In this century, through the labor of Dr. Rudolph Herzog of Tübingen, has been brought to light the great ruined Health Temple of Cos, where Hippocrates, the Father of Medicine, practised, Dr. Saleeby tells us in his book, *Sunlight and Health.* It was a temple to Æsculapius, son of Phœbus Apollo, god of the sun and of music and of medicine, a grouping of realms which medical men of today do not consider so widely separated as their forefathers might have done. The road from Cos to the temple was a sacred way and the priests were physicians.

This Health Temple was about two miles from the seashore and had an elevation of about three hundred and twenty feet above sea level. It was built on the slope of a range of mountains that rise from the southern coast of Cos to a height of nearly three thousand feet.

A drawing of the temple shows that its chief features were three sided, colonnaded and open stoas, or porticoes. There was evidence of an aqueduct and of great tanks or basins, doubtless used for the preliminary ceremonial ablutions of the patients.

Contributors to the Science of Medicine

Thomas Sydenham

Among English speaking medical men who have contributed to the advance of the science of medicine Thomas Sydenham occupies a conspicuous place. He was a commonsense, blunt spoken Englishman, but a genius in his way and one who observed for himself and acted upon his observations, being untrammeled by tradition. His methods were unorthodox to an extent which ran counter to the traditional dogmas of his profession to such an extent that they naturally invoked fierce and bitter attacks from his colleagues. No doubt his four years in the army and his travels and sojourn in foreign countries had largely dissipated narrow and provincial views and thus had kept his mind open and had prevented him from accepting without question all the fantastic medical theories of his time. His was an original mind and he probably did more to place British medicine on a sound footing than any other one man. Sydenham, the puritan, brought about almost a revolution in the conception and practice of medicine, while Wiseman, the royalist, his contemporary, did much for the uplifting of the art of surgery.

Thomas Sydenham was born at Wynford Eagle in Dorsetshire, towards the end of 1624, and died on December 29, 1689, in London. The average medical man knows little, as a rule, of the makers of medicine and surgery, although perhaps more is known of him who has been termed with justice the English Hippocrates, than of many of this glorious band. It is generally known, for example, that Sydenham did much to elucidate the subject of fevers, which before his time was in a state of great confusion. He was the first to give a vivid clinical description of scarlatina and his account of the form of chorea bearing his name is still regarded as a classic. Also he was largely instrumental in making general the use of Peruvian bark for agues and lastly he gave a remarkably clear and entertaining account of gout, from which he suffered himself.

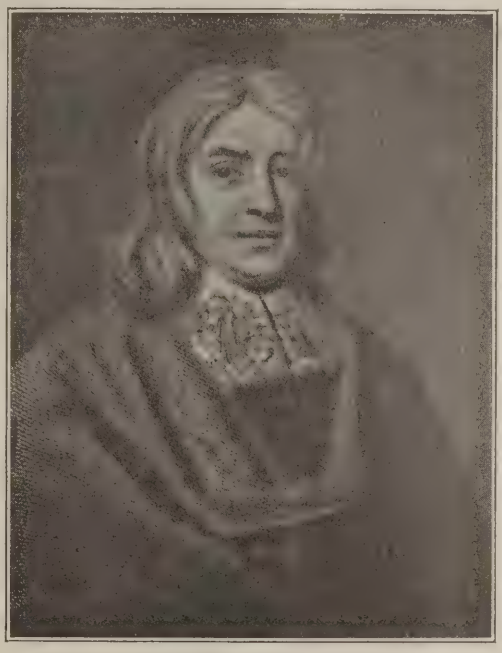
Facts regarding his early life are vague and fragmentary. It is known that he was the fifth child in a family of seven sons and three daughters. Both his father, William Sydenham, and his mother, Mary Jeffrey, belonged to old established families of importance and substance in the shire of Dorset. He was born into stirring times, as he had barely reached manhood before civil war broke out. The father, when an elderly man, served as captain in the Parliamentary Army, and was for some time a prisoner in the hands of the Royalist Army, and Thomas left his studies at Oxford to serve first as a trooper, and later as a captain in the Parliamentary Horse. In May, 1642, he had matriculated as a Fellow Commoner at Magdalen Hall, now merged into Hertford College, which was the centre of the Puritan movement in the University of Oxford. Before Sydenham matriculated, preparations for revolution had been made, and in August of that year civil war began. Sydenham's studies therefore at that time were brief. He joined the parliamentary forces and for a period of three and a half years was engaged in fierce guerilla warfare in his native county of Dorset. He was wounded in a sortie from Weymouth and in another sortie the royalist surgeon Richard Wiseman was nearly taken prisoner. In a petition to Cromwell, dated March 3, 1653, with regard to the recovery of certain moneys, Sydenham speaks of having "himself faithfully served the Parliament with the loss of much blood and thereby much disabled his body." It may be thought somewhat curious that Sydenham does not refer to his military experiences but when it is borne in mind that when he wrote Charles II was king and that he and his family had been staunch opponents this omission will be well understood.

Sydenham spent four years in war, returning to Oxford in 1646, and in 1647 entering Wadham College, he was created on April 14, 1648, a bachelor of medicine. In the same year he was elected a Fellow of All Souls' College in the place of an expelled royalist. In the next year he was appointed senior bursar of the college. Sir Christopher Wren, the great architect, was a Fellow of All Souls College at the same time. It is worthy of note that Wren, Boyle, the great scientist, and others formed some years later, the little coterie of friends in All Souls College, out of which the Royal Society for the Advancement of Science originated. In 1655 Sydenham resigned his fellowship and in the same year was married. By order of Cromwell he had obtained shortly before the money due to him and with this, the equivalent of about £2,000 at the present day, he set up practice in Westminster. At the time of the restoration of the Stuarts to the monarchy Sydenham spent a period of study at Montpellier, the celebrated French medical school. Here he is believed to have studied under Barbeyrac, a physician who had made for himself a great reputation throughout France, a man of original ideas, and of simple and successful methods of treatment. He was back at work in 1661 and in that year began his celebrated series of observations on the fevers prevalent between the years 1661 and 1675. In 1663 he was admitted Licentiate of the College of Physicians.

At that time it was illegal for anyone to practise medicine in or within some miles of London without possessing this license. During the early years of practice, the rule had been allowed to lapse for a time after the war, and in any event Sydenham had proved himself so loyal a supporter of Cromwell that it is unlikely that steps would have been taken against him. But the college now began again to assert its rights. On account of Sydenham's novel and successful methods of treatment he had many detractors and enemies and especially in the College of Physicians. However, if he had enemies he had also many warm friends. Many well known men abroad, too, adopted his views. One of Sydenham's

friends was Robert Boyle, already referred to as one of the founders of the Royal Society, and one of the greatest scientific geniuses of all time. John Locke, the well known physician, was another great friend of Sydenham. Not being a ready writer it seems that several of Sydenham's published works were written on the earnest solicitation of distinguished friends, and some of his shorter writings take the form of epistles addressed to members of the profession. It was apparently the custom of Sydenham to receive pupils into his house. Bartholomew Beale, for instance, who afterwards practised in Coventry, and whose mother, Mrs. Mary Beale, painted the portrait of Sydenham now in the building of the College of Physicians in London.

As said before, when Sydenham returned to London after his visit to Montpellier, he must have spent much of his time in the observation of fevers. His *Methodus Curandi Febres Propins Observationibus Superstructa,* of which the first edition was issued in 1666 and in the same year reprinted in Amsterdam, was his first medical publication, at the age of forty-two years. His best known and perhaps most valuable treatise or monograph is that on gout, a disease from which he suffered more or less severely from the age of thirty. In a day when bleeding, purging and sweating were the only modes of treatment recommended for gout, he used to advise his patients to reduce the number of their meals, to take a milk diet, to go to bed and to get up early and to take a moderate amount of exercise daily. Contrary to the medical theories of the time, he held that acute fevers were a protective mechanism of the body. He believed that nature was always striving to fight disease, and he advocated a return to the Hippocratic practice of watching and aiding the natural crises in disease.



THOMAS SYDENHAM

Sydenham's works, which were all written in Latin not always of the best, were brief and to the point and, as a rule, so far as treatment was concerned greatly in advance of the times. Although he was imbued with some of the old traditional superstitions of Arabian medicine, which dominated treatment at that period, on the whole he shook off the trammels of tradition and reverted as much as possible to the doctrines taught by the Greek school. Sydenham was *facile princeps* the great clinical teacher to a great extent, his treatment was governed by the results of his own observations and to a lesser extent by his own experiments. He was an extremely acute observer and the great master of expectant treatment, leaving the patient to rely on the natural powers of resistance of the body for the most part, only intervening with artificial aid when serious symptoms supervened.

It may be well believed that this expectant treatment met with great opposition at the time when Arabian therapeutics held full sway and medicine was regarded by the public as a mystery and the doctor as a kind of medicine man. This belief was deliberately fostered by the heads of the profession, who found it less trouble and more to their pecuniary advantage to let matters rest. The pioneer in any branch of endeavor is looked upon with distrust by his established brethren and the reformer is invariably considered a mischievous crank who ought to be promptly and completely suppressed. Sydenham was no exception to this general rule founded upon certain inherent human traits. As said before he was in ill odor among the self seeking of the profession, that is the majority who antagonized him and his methods by all means in their power.

Sydenham insisted upon the great underlying principles of medicine which indeed are everlasting. He was a man of foresight and of great commonsense and what he wrote concerning disease and its treatment for the most part was not for an age but for all time. Among his medical writings and observations those on the history and cure of acute diseases, on the epidemic diseases, on venereal disease and on smallpox deserve especial mention. In the treatment of lues venerea Sydenham appears to have been the originator of the idea common in later times that the cure was effected by the salivation which the administration of mercury induced and not directly by the mercury. In the treatment of phthisis Sydenham introduced into England the method of fresh air and voyages practised by the ancient Greeks and Romans and incidentally it may be that pulmonary tuberculosis must have been considerably more prevalent in England in the seventeenth century than now, as on the authority of Sydenham it is stated that two thirds of all the people who died of chronic disease perished from this cause. Apart from gout, which was the bane of Sydenham's life, from the age of thirty he appears to have had a happy domestic life. As for personal appearance, the portraits painted by Mrs. Mary Beale and Sir Peter Lely give a good idea of the man. It is to be gathered that he was of a robust, sanguine physique, with brown hair worn long without a wig, that his eyes were grey, his expression sad if not gloomy, grave but not austere and kindly though not suave or polished. His manner as befitted that of a one time puritan and roundhead trooper was, it may be imagined, blunt and forcible. Sydenham died on December 29, 1659, at his house in Pall Mall, London, and was buried in St. James' Church, Piccadilly.

The illustration is from a picture in the Hall of All Souls College, Oxford.

Editorial Articles

NATIONAL POLITICS AND HEALTH

Politically, Washington is *sui generis,* which, in the language of a certain autogenous statesman, does not mean a generous Swede. Aside from the professional statesman and that shady group which alleges to have inside information and underground prestige and whose methods would shame a case hardened racetrack tout, the city contains a large population group composed of professional uplifters who are ready to reform something and to tinker with the vitals of the ship of state at a moment's notice. These three bodies give the political atmosphere of Washington its essential bouquet, which the clerkly class and the military stratum do little to dilute. Intensely selfcentred, Washington in spirit is as far away from the rest of the country as it is possible to get and therefore political forecasts from the Capitol are almost always wrong. It was freely prophesied in the District, for example, that the bonus bill would not pass. It passed. It was the general belief that the Senate would sustain the veto. It did not. It was believed that the child labor amendment would not be passed. It was. There is only one safe guess in Washington: the opposite of the current rumor is generally correct. Conversely, the opinion in the country, unless it is an overwhelming votegetter, is not the opinion of Washington.

Consider what has happened to the long desired Department of Public Health. Time and again medical luminaries have appeared before congressional committees to give expert testimony as to the necessity of grouping under one head all of the medical, sanitary and welfare functions of the government. They were listened to with bored politeness; the altruists returned to their homes; a few paid workers remained on the job until the money gave out; the hearings were neatly embalmed in public documents; nothing happened and two or three public spirited physicians were disillusioned of a portfolio.

The philosophical say that the plan is a good one and is a part of the "check and balance" principle on which our form of government rests; that we are approaching the British system, which generally requires a generation of effort before an elemental law can be enacted; that precipitate legislation is unwise and carries undreamed of consequences in its train. All of which is platitudinous verbiage. The minute a National Department of Health can be made a campaign issue, the moment that the people want it sufficiently to go to the polls on the question, Congress will begin to sit up and take genuine notice and not until then. Minor platform planks expressing academic interest in health matters will do little to this end. Platforms are little read and soon forgotten. The presence of a lively epidemic would do more than many orators; the voice of Farmer Corntassel will be more provocative of action than that of Dr. Pillbags; above all, the people who want a National Department of Health must get together on a practical program—one in which there is less uplift and more economic wisdom. Washington is nauseated with half baked plans; Political Washington regards most of the Department of Health talk as bunk and it is doubtful if health alone can ever be made into a department. A Department of Public Welfare to replace the Department of the Interior and to include education, health, hospitalization, and pension features is more highly thought of, and had President Harding lived it was the hope of Brigadier General Sawyer that something might be accomplished along this line. Just now everything seems to wait on some one man who is strong enough to decide what is to be done and fearless enough then to go and do it. Meanwhile, we have no National Department of Public Health.

SOME ASPECTS OF THE TUBERCULOSIS PROBLEM

Tuberculosis we have with us always, and although in this country it has decreased in recent years, it remains still the most destructive disease to life and health. There is no doubt that the most effective way of fighting tuberculosis is to prevent it; not so much to prevent it from exhibiting itself, but to prevent it from developing from the early stage, when, in fact, it may be permanently checked. Environment, diet, and so on, indeed careful hygiene, generally are the most effective preventive measures; doing away with the slums of cities, housing the population in hygienic dwellings and providing healthy factories and workshops, providing nutritious food and educating each and all what to eat.

The leading authority on certain aspects of the tuberculosis question is Professor Theobald Smith, of the Edinburgh Medico-Chirurgical Society and gave an address on the subject at a joint meeting of the Edinburgh Medico-Chirugical Society and the Tuberculosis Society of Scotland. Professor Smith referred to the immunization method of grappling with the problem and pointed out to the

audience the difficulty of killing the tubercle bacillus because of the way in which it protects itself by a fatty envelope, a difficulty which Professor Dreyer of Oxford thought he had overcome, and also by causing the formation of a tubercle.

In summarizing the history of bacteriology he recalled the classical work of Koch and added that he did not think research work was so well done nowadays. Professor Smith emphasized the point that all the researches which had been done did not tell us everything, for today we may still legitimately ask the question, What are the channels of infection? In 1901 came the announcement of the distinction between the human and the bovine bacillus. The idea, though only in 1901 recognized widely, had, in fact, been adumbrated by the lecturer himself some years before, and speaking in 1908 Professor Koch publicly acknowledged that its origin was Professor Theobald Smith's paper in 1896. It should always be borne in mind that it was Professor Smith who first suggested the bovine origin of certain forms of tuberculosis. Moreover, he discovered what is now known as the phenomenon of Theobald Smith, with its important bearing on anaphylaxis.

In historical succession to the announcement of the distinction between the human and bovine bacillus came the work of the French school, which laid claim to having established the fact that ingestion of the organism in childhood was the cause of all tuberculosis. Somewhat later and even in our own day appeared the question of superinfection and its profoundly important bearing on the course of the disease.

Professor Smith explained the line of the more recent work. It was the method of making a large number of autopsies of cattle infected with tubercle. In the greatest number the disease affected the lymphatics draining the lower lobes of the lungs. This raised the interesting problem of why the upper lobes were more commonly infected in man. In the opinion of the lecturer the entire lung is infected originally, but the morbid process is suppressed in all but the upper lobes. An interesting question is raised by the predominance of lymphatic tuberculosis in cattle. Children are affected in the same way. Through economic selection all cattle are killed in what is their infancy, and thus in studying morbid processes in them we are really studying a stage which is strictly analogous to human youth or adolescence.

Professor Smith has made prolonged experiments in bovine vaccination. The lesson of these experiments is that some immunity is produced. The science of public health has reduced the tendency to tubercuosis. Each of us is vaccinated *malgre lui*, but in spite of this therapeutic vaccination is of the greatest use in the great majority of cases with symptoms.

As said before, perhaps the main hope of extirpating tuberculosis, or at least of greatly diminishing its incidence, lies in preventive measures. Greatly improved hygiene of dwelling houses, factories and workshops will do much in this direction. In addition, of course, cases calculated to spread infection should be isolated. At the same and in the meantime the two great problems of modern bacteriology must be borne in mind, the application of the principles of immunity and the discovery of a hemotherapeutic agent. If preventive and bacteriological measures are carried on with energy and enthusiasm the prospects of a successful campaign against tuberculosis are bright.

THE HUMAN FOOT

The human foot seems a failure so far as keeping its shape is concerned, but, as is the case in other human shortcomings, there is much reason for this weakness in the abnormal conditions to which it must attempt to adjust. The arch of the foot is a recent development, for there is little trace of it in the other primates and it is the newly acquired structures which are least in condition for withstanding unnatural stress and strain. Flatfoot is simply a reversion to an ancestral condition. "The chief breakdown," as Sir Arthur Keith points out, "occurs at the midtarsal joint, particularly between the head of the astragalus and the rest of the tarsus."

"In the pronograde monkeys the midtarsal joint is a flexible joint, but in the orthograde gibbon one no longer sees a pure flexion movement in this joint. . . . However, even in the least arboreal of the great anthropoids, there is no arch; the sole of the foot is applied flatly to the branch which supports the weight of the animal. . . . The evolution of the human from a grasping foot was necessarily attended by the creation of a neuromuscular mechanism for maintaining the plantar arch. The muscles which became adapted for this new function were those for inverting, everting, and fixing the tarsal elements of the simian foot. . . . Flatfoot occurs when the postural function of the supporting muscles breaks down. Why the postural muscular mechanisms of the body are so apt to become disordered we do not know. When that of the plantar arch breaks down the human foot reverts to a condition comparable to that seen in the grasping arboreal foot of anthropoids. The midtarsal joint becomes again freely movable; the metatarsal elements of the foot become turned outward or everted

just as they are in the foot of an animal when seizing a branch."

With regard to hallux valgus Sir Arthur is refreshing in that he takes a larger view than that it is due to the shape of the shoe, for he has found that the great toe of the child or of the unshod races does not always follow the line of the inner border of the foot but may as often be directed outward or in a direction somewhere between these extremes. Of course, the shoe can be blamed for a bunion, but the outward direction of the great toe may be a normal condition.

TO PREVENT THE TURNING OF ROUND LENSES

Oh, what's the use, was our first reaction when we read this title to a paper by David W. Wells in the *Boston Medical and Surgical Journal* for November 6, 1924. Who, we thought, has ever known fashion to modify her whims and vagaries in response to appeals of reason, or to consider the health and comfort of her votaries? Round spectacle lenses with shell or celluloid frames have been the fashion now for a number of years. The manufacturers have the entire business in their hands, they are not anxious to add a mite to the costs of production unless shown that they can reap an additional profit thereby, the demand is almost universal and there are always cranks who object to everything. Can you blame them?

Round lenses are all right so long as they are simply spherical and made to correct myopia, hypermetropia, and presbyopia. But what Dr. Wells says of the evils resulting from them in cases of astigmatism is absolutely true. We discussed this editorially in July, 1919, and lined ourselves up with the cranks. The ophthalmologist spends hard work with good gray matter to determine the amount of astigmatism and its exact axis. To fill the prescription a cylindrical lens must be placed before the eye with the axis of the cylinder at a certain degree of the circle and, what is quite as important, must stay there. If the lens is turned so that the axis is at another degree of the circle, the astigmatism is no longer corrected, the lens is a misfit and perhaps worse than useless. Ever since round lenses in shell or celluloid frames became the fashion our prescriptions have been filled with them, the lenses often simply sprung into the frames with nothing to hold them in place except friction. Dr. Wells says that shell and celluloid frames give the most trouble because they shrink and swell with atmospheric changes, and he is probably right. It is certain that a lens can frequently be turned in its frame while wiping it. The relief a patient feels when he begins to wear the glass disappears as soon as the axis is changed and his symptoms reappear, perhaps in an aggravated form. As an example of this, Wells quotes the case of a patient who returned from Europe on account of eyestrain, which was found to be due wholly to such a turning of the lens.

Remedies are so simple as to seem ridiculous, yet they have appeared to be impossible to obtain. Unless the lens is perfectly round it cannot turn, the least change in shape is sufficient. Many devices have been suggested to hold the lenses in place, but each adds a trifle to the cost of production. Individual ophthalmologists who protested found themselves butting their heads against a stone wall. In groups they fared little better. In 1919 the Section on Ophthalmology of the A. M. A. adopted a resolution "recommending that frames with circular lenses be furnished with some device to prevent rotation of the lenses in their frames." There the matter seemed to drop.

Dr. Wells says that "if the spectacle wearers knew the danger, they would insist on being protected," but we have our doubts. The mover of the resolution referred to above called attention to the fact that a number of the members present were wearing just such glasses as those condemned. They were well aware of the danger. More than one had a little scratch in the edge of the glass and a corresponding one in the edge of the frame so that he could ascertain at any time whether his lens had been turned, and be able to replace it in position when necessary. Are patients less oblivious to danger than doctors? Don't they take chances, too?

But at the end of the paper comes a word of encouragement. Dr. Wells tells us that one of the largest optical companies in the country has agreed to furnish hereafter all round frames with some device to prevent the turning of the lens. This is good news. If the other manufacturers will follow suit the ophthalmologist can hope for better success in the relief of astigmatism than he has had for some years. We certainly hope that they will.

ANOTHER ALCOHOL SYMPOSIUM

The question of the therapeutic value of alcohol or whether it has any therapeutic value or whether it is at all times a poison, is a question which is never allowed by the medical profession to rest for long. It is in Great Britain where the chief concern with respect to this much discussed subject is being exhibited. Within the space of a year, the well known physiologist Prof. E. H. Starling has published opinions from distinguished authorities regarding alcohol. The English Medical Research Council in the early part of this year caused to be

ublished a thoroughly revised edition of a previous ublication on alcohol, its action on the human or-anism, and in October of this year the *Practitioner* evoted its issue to consideration of the alcohol ques-on from various standpoints.

The *Practitioner* records, perhaps, the medical iew of the matter rather than the scientific and on ne whole is probably in line with medical opinion in his country. While alcohol has fallen from its igh estate as a medicine, it is curious and instructive o note that many medical men cling to the belief hat alcohol possesses certain therapeutic virtues. t has been shown that the main action of alcohol is onfined to the nervous system and that it is a arcotic and not a stimulant, but it has been ex-lained too that in certain circumstances its sedative ffects may be useful. Its action as a narcotic, how-ver, is not due to any direct stimulation of the ervous system on the heart by the drug, but to its veakening of the excessive check on the heart's ction exercised by the nervous centres, and to its edative influence on the higher levels of the brain, elieving pain and anxiety and increasing the gen-ral comfort of a patient.

In the *Practitioner* the physiology and pharma-ology of alcohol is dealt with by Professor Starling vho propounds views similar to those given above. Sir Arthur Newsholme contributes a cogent paper n which he discusses prohibition in this country rom first hand knowledge. Being essentially a pub-ic health man he dwells on the matter from its ocial aspects and states that "The amount spent n drink in 1923 would have paid the rental of very house, farm, shop, factory and estate in Great Britain" and moralizes thus: "Evidently then, there need be no housing problem were there no drink problem."

The case against alcohol as a medicine except in he few circumstances already referred to is strong. n fact, most of the articles in the *Practitioner* which praise some points of view of alcohol as a nedicine, follow this by a qualifying but.

The conclusions to be gathered from this last ymposium on alcohol as a medicine is that it has ts value but a limited one as a narcotic. As a food much the same remarks may be made. It is readily absorbed into the system and can be used to supply a considerable proportion of the fuel needs of the body, and therefore may be of value in some condi-ions of disease and convalescence. There is, how-ever, a but here, as it is a food suitable only for such emergencies. Regarded physiologically alcohol taken n moderation with most people will do little appre-ciable harm but according to most scientific and medical authorities will do no good. On the other hand, alcohol taken to excess will do direct harm. The balance of evidence from the medicoscientific point of view is strongly against alcohol.

PARTIAL SURVEY OF TUBERCULOSIS CONTROL

In most civilized countries tuberculosis has been controlled to a considerable extent, and perhaps this control is more greatly in evidence in this than in any other country. In England and in certain parts of Europe, Germany, for instance, the efficient control of tuberculosis has been much hindered by the war and its aftermath. Where a sufficiency of nourishing food is not obtainable, tuberculosis is certain to flourish, and it probably is because the people of this country are able generally to obtain plenty of good food, that the fight against tuberculosis has been successful on the whole.

In an original article published in *Minnesota Medicine*, August, 1924, contributed by Dr. G. L. Tuohy, of Duluth, in which he discusses twenty years' observation of tuberculosis control in Minnesota, some very interesting points are dealt with. In his opinion the international congress held in Washington in 1908 had a most profound impression upon tuberculosis in America, and he thinks that what Newsholme said, "We are checking tuberculosis in England by hospitalizing the advanced cases," made the greatest impression upon those who attended the congress and supplied the keynote for the subsequent campaign in America and in Minnesota. It seems obvious that unless advanced cases, those in a contagious form, are isolated, infection must be spread. Therefore, the first step to take is to isolate advanced cases.

Again Tuohy draws attention to the knowledge which has been gained that truly incipient tuberculosis is found in childhood and it is on account of this happening that incipient tuberculosis is not found in our offices or sanatoria. While agreeing that adults may acquire tuberculosis and that children may be infected with the bovine bacillus, it still must be allowed that most children are inoculated by way of the bronchial tract from a human source. Thus it has been forcibly driven home to us that it is dangerous to house children and open cases of tuberculosis in the same room. It would appear, judging from the experience of Germany at the present time and of Ireland in days gone by, that the prevalence and virulence of tuberculosis depends chiefly on food and environment. Where both are bad or lacking in essential qualities, tuberculosis stalks through the land. Tuohy praises, and no doubt rightly, properly conducted sanatorium treatment and states that this form of treatment has played a con-

siderable part in the very encouraging decrease of tuberculosis in this country. In the prevention and treatment of the disease, isolation of open cases is absolutely necessary for the protection of the community. Sanatoria and colonies are useful adjuncts, but it appears that the main reliance for the prevention of the disease is good food and housing, that is, personal hygiene and appropriate diet. Tuohy suggests that general practitioners should again become interested in treating pulmonary tuberculosis. For although rest, food, fresh air, heliotherapy, and so on, have been advised in a general manner, these have been advocated in a too happy go lucky fashion and "what is needed is some of the same intelligent application of correct principles in private practice as is now seen in our special clinics and hospitals."

Finally he argues that it is necessary by every means in our power to place a hypothetical cordon about every positive sputum case, rendering it easy for the doctor to do his obvious duty in safeguarding his fellowmen. In order to effect this, every agency must be called upon and the general practitioner, in particular, must familiarize himself with up to date methods of treating pulmonary tuberculosis. Figures in this country with regard to tuberculosis testify what can be done by common sense measures and encourage the hope that by intensifying and improving existing methods and by introducing new ones and by instructing the general body of the medical profession how best to carry these out, aided by all the machinery of the public health services, pulmonary tuberculosis may be not only scotched but extirpated. The big epidemics have practically vanished or been ejected, and it is now time that two of the greatest scourges of civilization, tuberculosis and venereal disease, should be dealt with seriously and severely. To do this the public must earnestly cooperate with the medical profession. No half way measures will be of any avail and the money cost will be immense. But as a great statesman, some say Disraeli, said, "the health of the people is the highest law," and nothing should be allowed to stand in the way of its execution.

ADDITION TO POST-GRADUATE HOSPITAL

The property recently purchased and taken over by the New York Post-Graduate Hospital comprises the entire block front from Twentieth to Twenty-first Street on Second Avenue, and about two hundred feet on the cross streets. The building was that formerly occupied by the United Hebrew Charities. The addition of this tract makes the Post-Graduate the largest of its kind in the world. The basement of the new building will be used for a dining room for employees, and for clinics. The offices of the medical school and the library and reading room will occupy the main floor, and dining rooms for the staff will be on the second floor, which is connected with the other building by a bridge. The interns will be quartered on the third and fourth floors, and twenty-nine beds for patients will be installed on the fifth, which will make the hospital's bed capacity 410.

EYE ACCIDENTS LAST YEAR

In a report recently circularized by the National Committee for the Prevention of Blindness, it is stated that at least 4,456 persons in the United States had their sight either destroyed or seriously impaired during the last twelve months. Men and boys made up eighty-five per cent. of the victims, leaving only 604 of the casualties suffered by females. Industrial accidents were by far the most numerous; sixty-five persons were struck by baseballs; drinking wood alcohol destroyed or impaired the sight of thirty-five persons; thirty-one women burned their eyes with curling tongs; boys with sling shots injured the eyes of twenty-seven, and bows and arrows those of twenty-four; golf ball accidents impaired the sight of seventeen.

Obituary.

ANDREW R. WARNER, M.D.

Chicago, Ill.

Although Dr. A. R. Warner, executive secretary of the American Hospital Association, had been ill for nearly a year, his death came as a great shock, as he was apparently recovering. He died suddenly at his home in Deerfield, Illinois, November 27th, from heart disease.

Doctor Warner was born in Pulaski, New York, in 1875. He was graduated from Hamilton College in 1899 and from Western Reserve University Medical School in 1906. Subsequent to graduation, he practised medicine in Cleveland, Ohio, for a few years. The first hospital position he held was that of assistant superintendent of Lakeside Hospital, Cleveland. In 1913 he became its superintendent, a position he held until his appointment as executive secretary of the American Hospital Association on October 10, 1919.

Doctor Warner was always deeply interested and active in the development of organized hospital activities. He was one of the founders of the Cleveland Hospital Council and of the Ohio Hospital Association and served as president of the Ohio Hospital Association in 1918 and 1919. He was also instrumental in developing and organizing the American Conference on Hospital Service and served continuously as vice-president of the conference from the time of its organization. He was a Fellow of the American Medical Association. From the beginning of his hospital career he was interested in the work of the American Hospital Association, serving on several of its important committees. In 1918 he was elected its president. His earnestness and enthusiasm in the organization of hospital activities won for him nationwide and international recognition.

News Items.

Dr. Fowler Honored.—Dr. Russell S. Fowler was honored at a dinner on December third, marking the twenty-fifth anniversary of his service as chief surgeon of the Wyckhoff Heights Hospital.

Dr. Roussel Honored.—Dr. Albert E. Roussel, of Philadelphia, professor of medicine at the University of Pennsylvania, has been awarded the decoration of Chevalier of the Legion of Honor. He has previously received the decoration of the *Palmes Academique*.

Civil Service Examinations.—Examinations will be held for junior medical officer, assistant medical officer, associate medical officer, medical officer, and senior medical officer, applications being received until June 30th by the U. S. Civil Service Commission.

Harvey Society Lecture.—Dr. A. R. Dochez, professor of medicine, College of Physicians and Surgeons, Columbia University, will deliver the sixth Harvey Society Lecture at the New York Academy of Medicine, on Saturday evening, January 17, 1925. His subject will be "Etiology of Scarlet Fever."

Cancer Study Award.—The commission for the distribution of the prize for cancer study founded by Dr. Sofie A. Nordhoff-Jung, in agreement with the foundress, has resolved to distribute the prize from now on only every two years to the double amount of the sum allotted heretofore, that is, One Thousand Dollars. The next prize will reach distribution in 1926.

Warren Triennial Prize.—Announcement is made by the general executive committee of the Massachusetts General Hospital that dissertations on some special subject in physiology, surgery, or pathology, in English, French, or German, will be received until April 15, 1925, in competition for the Warren Triennial Prize of five hundred dollars. Details may be obtained from the hospital.

Dr. Fuhs Honored.—Dr. Jacob Fuhs, of Brooklyn, was the guest of honor at a dinner given by four hundred of his friends, at the seventy-fifth anniversary of his birth and the fiftieth of his graduation in medicine, from the College of Physicians and Surgeons. Six volumes of the *Annals of Medical History* were presented to him. Dr. Frank F. Jennings making the presentation speech. Representatives were present from the medical societies with which Dr. Fuhs is connected, and several addresses were given.

Health Examinations.—The Medical Society of the County of New York has issued a pamphlet on periodical health examinations. In it are listed courses in the technic of conducting such examinations, to be held at the Post-Graduate Medical School (information to be obtained from the Dean). Courses are also contemplated at the Cornell Medical School and at the College of Physicians and Surgeons. There are also to be given a series of addresses on Tuesdays and Thursdays in January, at four o'clock at the Academy of Medicine.

Training of Tuberculosis Nurses.—The Public Health Committee of New York Academy of Medicine has passed the following resolution regarding the training of nurses in the care of the tuberculous sick:

WHEREAS, There is a well recognized and widespread need of trained nurses for the care of tuberculosis patients, and

WHEREAS, The nursing of such patients requires a special technic which, as a rule, is not taught in the course of the training of registered nurses for the reason that most of the hospitals in which such nurses are trained do not take cases of pulmonary tuberculosis, and

WHEREAS, It is found that registered nurses as a rule give themselves up to the care of pulmonary tuberculosis with great reluctance, or not at all, and consequently there is a very great shortage of properly qualified nurses to take care of this large group of cases, and

WHEREAS, The chief source of supply of nurses for the care of pulmonary tuberculosis is from women who have themselves had tuberculosis and been cured of it, therefore be it

Resolved. That the Public Health Committee of the New York Academy of Medicine favor an amendment to the Nurse Practice Act which shall give official recognition with a suitable title to graduates of training schools operated in conjunction with tuberculosis sanatoria in this State, provided the sanatoria meet the requirements to be established by the Board of Regents and provided the course of instruction be of at least two years' duration and that it meet also any specific requirements for the training of nurses to care for the tuberculosis sick, which shall be formulated jointly by the Board of Regents and representatives of the tuberculosis sanatoria in the State.

Official recognition of this type of nurse with a suitable title would be similar to the recognition accorded to graduates of training schools in the State institutions, or institutions under the visitation of the State Hospital Commission. (Chapter 742—Public Health Laws of 1920. Paragraph 252-c).

Postgraduate Study in London.—The Fellowship of Medicine and Postgraduate Medical Association, London, announce a number of postgraduate courses on special subjects to be given in various London hospitals, during the coming year. Detailed information may be obtained from the secretary of the Fellowship of Medicine, 1 Wimpole street.

Reports of Typhoid Cases.—Owing to the considerable prevalence of typhoid fever in New York, the Public Health Committee of the New York Academy of Medicine suggests to the Fellows of the Academy that they report their cases in detail and cooperate in every possible way with the Department of Health, in its efforts to discover the cause or causes of the present outbreak.

Personal.—Dr. J. S. Rodman, secretary-treasurer of the National Board of Medical Examiners, has accepted the chair of surgery in the Woman's Medical College of Philadelphia.

Dr. Herman Goodman gave the first of a triology of talks on tropical dermatology before the Clinical Society of the New York Skin and Cancer Hospital on December 26th. His subject was "Frambesia Tropica and Syphilis."

Dr. Max Einhorn, New York, has been elected corresponding member of the "Société de Médécine de Paris."

Dr. Walter H. Brown, who has been director of the child health demonstration at Mansfield, Ohio, will take charge of the demonstration to be made in Marion County, Oregon. He will be succeeded in Mansfield by Dr. William de Kleine, health officer of Saginaw, Michigan.

Meeting of Westchester County Medical Association.—The next meeting of the Westchester County Medical Association will be held on the evening of January 20th, at St. Johns Hospital, Yonkers. Dr. Willy Meyer will speak on "Advanced Pulmonary Tuberculosis,—a Borderline Disease;" and Dr. S. Adolphus Knopf will speak on "Something Old and Something New in Pulmonary Tuberculosis." Under the former he will discuss the early recognition of the disease, and under the latter he will demonstrate his new method of controlled diaphragmatic breathing as an adjuvant in the rest cure.

Meeting of Medical Association of Greater New York.—At a meeting of the Medical Association of the Greater City of New York, to be held on the evening of Monday, January 19th, at the Academy of Medicine, Dr. Haven Emerson will speak on "The Dependence of Increased Life Expectancy Upon the Private Practice of Preventive Medicine." Dr. S. Adolphus Knopf will present a paper on the subject of "The Psychology, Psychopathology, and Psychotherapy in Tuberculosis in Civilian and Military Life."

Society News.—At a recent meeting of the American Stomatological Association, the following officers were elected: Dr. Homer E. Smith, New York, president; Dr. Oliver T. Osborne, New Haven, Connecticut, and Dr. Noah Philip Norman, New York, vice-presidents; Dr. Robert H. Rose, New York, treasurer, and Alfred Asgis, D.D.S., New York, secretary.

The Yorkville Medical Society of New York has elected the following officers: President, Dr. Charles N. Gelber; first vice-president, Dr. Adolph Stern; second vice-president, Dr. I. Glassman; corresponding secretary, Dr. M. Meltzer; recording secretary, Dr. S. Morse; treasurer, Dr. H. O. Klein; Trustees, Dr. A. S. Blumgarten, Dr. M. F. Goldberger, and Dr. A. Kahn; chairman of committee on ethics, Dr. J. L. Wollheim; chairman of committee on legislation and economics, Dr. Henry Keller; chairman of committee on ways and means, Dr. M. Peshkin; chairman of committee on admissions, Dr. A. Shoen; chairman of committee on new members, Dr. M. Frantz.

The Eastern Medical Society of New York has elected the following officers: President, Dr. Nathan Ratnoff; first vice-president, Dr. A. J. Rongy; second vice-president, Dr. Joseph Bieber; treasurer, Dr. J. F. Saphir; recording secretary, Dr. I. Seth Hirsch; corresponding secretary, Dr. Harry E. Isaacs; trustees, Dr. Abraham Strachstein, Dr. Israel Strauss (for one year); chairman of committee on ethics, Dr. L. J. Ladin; chairman of committee on legislation, Dr. M. Keschner; chairman of committee on admission, Dr. J. Barsky; chairman of committee on new members, Dr. M. R. Robinson; chairman of committee on medical economics, Dr. Emil Altman.

Jubilee of the London (Royal Free Hospital) School of Medicine for Women

MISS LOUIE M. BROOKS
London,
Warden and Secretary to the Hospital

Fifty years ago the medical register of Great Britain contained the names of only two women. Of these, one had attained her place through a foreign qualification; and the other had slipped through a loop hole in the charter of a qualifying body. The roads by which these pioneers had entered the medical profession were definitely barred against all who might try to follow. No university and none of the Royal Colleges would admit women either to medical education or examination. Today there are over two thousand women on the register. They hold important hospital appointments, in the institutions peculiarly their own, in special hospitals and in certain general hospitals; they hold distinguished posts in various government departments, under municipalities, in the Women's Indian Medical Service, and under the chief missionary societies; and they are succeeding professionally and financially in private practice.

While several factors contributed to the resolution that has been accomplished within the last half century, there can be no doubt that the leading part was played by the London School of Medicine for Women whose jubilee was celebrated in November.

The London (Royal Free Hospital) School of Medicine for Women (University of London). Founded in 1874.

It is interesting to note that America played an important part in the developments that led to the founding of the school. The first woman doctor of modern times was Elizabeth Blackwell who emigrated with her family from Bristol to America when still a child. On the death of her father, Elizabeth Blackwell took up teaching in Ohio. Moved by a desire to be of greater use to women she determined to take up the study of medicine, in spite of her strong distaste for everything connected with illness. She succeeded in obtaining entry to the University of Geneva, New York State, by a resolution of the students that "one of the radical principles of a Republican Government is the universal education of both sexes." "In extending our unanimous invitation to Elizabeth Blackwell," continued the resolution, "we pledge ourselves that no conduct of ours shall cause her to regret her attendance at this institution"—a contrast to the spirit in which the pioneers in England were received later.

After her qualification, Elizabeth Blackwell returned to England to assist the movement there for the medical education of women. At one of her lectures she notes that her "most important listener was the bright intelligent young lady whose interest in the study of medicine was then aroused—Miss Elizabeth Garrett." On her return to America she found in the first class she conducted at the College of the New York Hospital for Women, the third of the great pioneers in medicine—Sophia Jex-Blake.

Although Elizabeth Garrett—better known as Mrs. Garrett-Anderson—had passed the examination of the Society of Apothecaries in 1865 and thus obtained a place on the medical register the society had altered its regulations so as to prevent the admittance of other women. Faced with this situation Sophia Jex-Blake went to Edinburgh and endeavored to obtain a medical education at the university there. For four years she led a little party of women through all the trials and difficulties that were put in the way. She was first rejected, then accepted, then rejected again. She was mobbed by the male students, sued for libel, involved in a legal action against the University to secure admission to examinations, and finally ploughed in an examination. This rebuff was followed by the sustaining of the University's appeal against the Court's judgment, the door of the University was definitely closed to women, and the pioneer and her companions found themselves further back than when they started. Never did a gallant attempt end in more disastrous failure.

Beaten at Edinburgh, Sophia Jex-Blake came to London and achieved a success that gives her forever an outstanding place in the history of women in medicine. Almost single handed, and in face of tremendous difficulties she gathered together a body of sympathizers and, with £1,300 as "working capital," founded the London School of Medicine for Women in 1874.

By 1877, when the first thirty-seven women had completed their curriculum the school seemed as forlorn a hope as ever. Although an Act of Parliament of the previous year had given medical examination boards power to admit women to examination, none had taken advantage of it. No hospital would admit the women to clinical instruction. The meagre funds had been exhausted and classes were suspended.

Suddenly the darkness lifted. A medical college

in Ireland admitted Sophia Jex-Blake and her companions to examination, through which they passed on to the medical register. At last a qualifying examination was definitely open to women. Within a few months the Royal Free Hospital, greatly daring, agreed to take women students for clinical work in its wards; and the University of London decided to admit women to examination.

Although Sophia Jex-Blake returned to Edinburgh to engage in private practice, her school in London went triumphantly on its course. A public appeal for funds raised £5,000 within a few months and teaching was resumed.

For the last fifty years the story of the school and the story of women in medcine has been practically one. Year by year the students have more than fulfilled all expectations, and the school has today as high a percentage of academic distinctions as any other. In 1897 Mrs. Garrett-Anderson, then dean of the school was elected president of the East Anglian Branch of the British Medical Association, and her year of office marked almost the complete and final entrance of women into the inner shrines of the medical profession. Practically the last barrier fell when, in 1909 the Royal College of Physicians and the Royal College of Surgeons opened their doors to women.

The school's connection with the development of medical services for the women of India has been a close one. When the first dispensary for Indian women was opened in Bombay, it was Dr. Edith Pechey, one of the Edinburgh pioneers who was put in charge. A few years later Mrs. Scharlieb, the doyenne of medical women in the Empire today, and still a practising specialist in Harley Street, became a lecturer at the Madras Medical College, a post which she quitted in 1897 to begin a teaching connection with her old school in London, of which she is president.

The school still stands on its original site in Hunter Street, Bloomsbury, although today far different from the two old houses in which Sophia Jex-Blake started its activities in 1874. The school was rebuilt in 1898 and opened by the late King Edward and Queen Alexandra. Before long the buildings were again found to be inadequate and a large extension, opened by Queen Mary, was added in 1916. The school has a graduate roll of over eleven hundred students; over four hundred women are studying within its bounds at the present moment; and it is able to accommodate an entry of seventy-five new students every year. The Royal Free Hospital still maintains the closest connection with

Outpatient Department, Royal Free Hospital

the institution it fathered in the difficult days of 1877 and, together with other affiliated hospitals, provides the necessary clinical experience for the students and also the house appointments after graduation which are an essential part of medical education.

In connection with the jubilee of the school an endowment fund of £60,000 is being raised to found three chairs—anatomy, physiology and pathology—to be named after Elizabeth Blackwell, Elizabeth Garrett-Anderson and Sophia Jex-Blake. Headed by a donation from Her Majesty The Queen, over £25,000 has already been raised. Many promises of help have been received from America and it is hoped that a substantial sum will be received from American citizens toward endowing the chair in memory of the medical pioneer whose success in America inspired the movement that has given women their place in medicine today.

Foreign Correspondence.

LONDON LETTER

(*From our own correspondent*)

LONDON, *November 21, 1924.*

HEALTH OF SCHOOL CHILDREN IN ENGLAND AND WALES

The annual report of Sir George Newman as the Chief Medical Officer of the Board of Education, entitled "The Health of the School Child in 1923," has just been published. The author begins by pointing out that "the restraining conditions under which the School Medical Service suffered in 1922 owing to the need for national economy began to be less oppressive in 1923. By the middle of the year the board was in a position to encourage authorities to consider reasonable improvements and expansions of their activities." During the year 1923 the number of elementary school children subjected to routine medical inspection was 1,754,919, and an examination of the returns furnished by the 212 local education authorities out of a total of 317 who supplied statistics shows that 19.4 per cent. of the children were found to be suffering from more or less physical defects which required treatment. The total number of defects treated, or under treatment, during the year, excluding dental defects and uncleanliness, in England and Wales, was upwards of 880,000. The great bulk of the medical treatment was provided at the 1,076 school clinics established by the local education authorities, or at 390 hospitals with which the authorities had made arrangements; but some of it especially in the rural districts was furnished by private medical practitioners or otherwise. For example, there were 473,000 minor ailments treated under the treatment schemes of authorities

and 63,000 otherwise; there were 157,000 errors of refraction of vision dealt with under schemes and 14,000 otherwise; there were 122,000 pairs of spectacles prescribed by authorities and 12,000 by other persons or agencies; there were 32,000 operations for adenoids or enlarged tonsils in the school clinics and 15,000 in hospitals or private practice, and there were another 32,000 cases of disease of nose and throat which received nonoperative treatment; 37,000 cases of ringworm were treated by the authorities and 6,000 cases otherwise. In 1923 the London County Council provided treatment for 218,000 children. In addition to the morbid conditions or physical impairment found at medical inspection there is a large group of children suffering from physical or mental defect, blindness, deafness, epilepsy, feeblemindedness, tuberculosis, and crippling, estimated approximately at 130,000, excluding socalled delicate children. For these children there are 530 special schools or sanatoria, accommodating 41,000. Systematic dental inspection reveals the fact that more than two thirds of the whole school population of England and Wales are suffering from dental disease. Dental inspection and treatments are being carried out, to a limited extent, by 240 education authorities in England and Wales; during the past year the total number of children dentally inspected was 1,557,249, of whom 1,077,774, or 67.9 per cent., were found to be in need of treatment. The actual number treated was 615,491, or approximately one tenth of the school population of the country.

SOME DISEASES COMMON TO CHILDHOOD

The opening address at the first of a series of discussions on the special character of disease during childhood adolescence, the climacteric and old age, held by the Chelsea Clinical Society, was delivered by Dr. Eric Pritchard, on November 18th. He dealt with some diseases common to childhood and considered the subject from a somewhat novel viewpoint. He described the special mechanisms on which the young child depends for protection against the disease provoking conditions of its environment mechanisms which, although the same nature as those possessed by the adult, are still in an immature and undeveloped state. The conception that disease or ill health is the result of somewhat clumsy and painful attempts to accommodate the individual to the conditions of the external environment was the avowed object of Dr. Pritchard's remarks, and he developed the argument by explaining the main reason why symptoms and symptom complexes were different in children from those manifested in adults. It was because in the two cases the mechanisms whereby these adjustments with the environment were secured were in different stages of development: in the adult they were efficient and well trained, in the child they were immature and inefficient. There were two additional reasons why the reactions of the child to the environment should be different from those of the adult and these were as follows: The infant especially, and the child, to a lesser extent, lived in a special and sheltered world of his own which was chosen for him by his mother, to the best of her ability in accordance with tradition and the dictates of nursery hygiene, and the other reason was that the child had very little control of that environment himself; he could not run away from it, or alter it to any material extent. In short, infancy and childhood are not long enough to enable the individual to learn how to adapt himself to his environment. It was pointed out that most of the pathological reactions or symptoms to which human flesh was heir were due to either food causes or to infective disease. In considering the symptoms which result to the child from food injuries, Dr. Pritchard did not deal with that perhaps overdiscussed matter, the avitaminoses, but considered the more commonplace type of symptoms resulting from an actual excess of food. The point is insisted upon that the protective reactions on pathological results of overfeeding take quite a different form in the child and in the adult, because in the one case the mechanisms for intercommunication, cooperation and the division and control of labor were in a very rudimentary stage of development and because in the other they were very highly organized. An infant or child who consumed too much food or unsuitable food would probably be saved from the more serious consequences of such indiscretion by a lesser evil, the violent reaction of the stomach, it would either vomit or have diarrhea or would show some other evidence of a breakdown of liver, kidney or general metabolic function. The infant relied largely on his motor mechanisms and on his skin and mucous membrane. The older child utilized his lymphatic system more largely. The adult, in whom the principle of the division of labor and cooperation was better developed, used all his mechanisms of defence with economic impartiality, delegating as far as possible the duty of defence to the humblest and least specialized cell workers, the connective tissues. Attention is drawn to the different forms exhibited by rheumatism in the infant, the child, and the adult.

Dr. Pritchard said it was his belief that rheumatism could occur in infants and young children, and that the adult was not exempt from the causes and effects of rickets. The address further pointed out that while the greater part of childhood was occupied with the acquisition of immunity, not only to the common infective diseases but also in acquiring immunity to the very varied bacterial fluid which infested the epithelial and mucous surfaces and of which adults were the safe and unconscious carriers. He added, however, that many infants died in the effort to become safe carriers.

BIRTH CONTROL AND THE CHURCH

Lord Dawson of Penn, in giving evidence a short time ago before the Birth Rate Commission of the National Council of Public Morals, argued that discussion of the principles and the methods of birth control should be kept separate. The methods of birth control should be set forth to those people alone whom they properly concerned. Regulation of the number and the occasions of child births had been brought about by several factors: 1, increasing density of population; 2, increasing sense of the value of child life and of the responsibility of parenthood; 3, desire of parents to equip their children in body and mind to the best of their ability; 4, social and domestic difficulties in the homes of educated people; 5, desire of woman for a larger share of the world's working, a share she could not

ake if her best years were exclusively absorbed in naternity. He asked if it were desirous to restore he conditions of former generations, namely, large amilies with their high death rates and rough and umble methods? If the answer were in the negative then the birth rate must and would be controlled. He pointed out that church authorities evaded the eal problem: they half apologized for sex love, or t other times seemed to ignore the existence of his dominating force of the world. Finally he drew ttention to the fact that birth control was spreading to the industrial classes, and there was every evidence that it had and would spread continuously. The Roman Catholic Church, with its compact organization, had failed to stop it. Nothing but convincing reasons that it was harmful or wrong, or both, would command any attention from the people. Mere statements that it was immoral, was contrary o the teaching of Christianity, or was condemned by the Bible, would only bring disrepute on those who made them, and especially among the young, who mattered the most.

NEW BOOKS

An excellent book written by Percy Hall, M.R. C.S., L.R.C.P., with introductions by Sir Henry Gauvain, M.A., M.D., M.C. (Camb.), and Leonard E. Hill, M.B. (Lond.), F.R.S., has been published recently by William Heinemann, Ltd., London.

The subject dealt with is ultraviolet rays in the treatment and cure of disease, and while it is a matter which has been widely discussed of late Dr. Hall has produced the clearest and most practical thesis on the question brought out as yet.

Another book published by the same firm the other day is a posthumous work. Its author, Dr. R. Murray Leslie, died shortly after the completion of this work on pneumonia. Dr. Leslie was easily one of the best medical writers in the English language from all viewpoints. He was an exceptionally brilliant man and one who not only possessed the knowledge but was able to clothe it in good English and with a fine literary style. Dr. J. Browning Alexander has thoroughly revised the book and brought it up to date and the monograph should prove of use to the medical profession.

LATIN AMERICA LETTER

(From our own correspondent)

PANAMA, *December 15, 1924.*

SEVENTH PAN AMERICAN SANITARY CONFERENCE

The Seventh Pan American Sanitary Conference convened at Havana, Cuba, on November 5, 1924, and closed its sessions on November 15, 1924, after electing Dr. Carlos Enrique Paz Soldan president. Dr. Paz Soldan is professor of hygiene in San Marcos University and is considered one of the foremost hygienists of South America. He has not only studied his profession in his own and many other countries, but has also produced a great volume of literary work chiefly upon his branch of science. The next meeting of the conference will be held two years hence at Lima, Peru. Among the most important matters taken up by the conference was the Pan America maritime sanitary code. This document was accepted by the eighteen nations represented at the conference with relatively few amendments as has been previously stated in these columns. The text of the code, which is in effect an international treaty, was prepared by the Pan American Sanitary Bureau at Washington, D. C. The conference also approved a model law with respect to the production and manufacture of foods and drugs with a view to its enactments by the various Governments of Pan America for the purpose of establishing uniform standards and guarantees.

ILLITERATE CHAUFFEURS

The general superintendent of public instruction of the Dominican Republic is establishing classes in Santo Domingo as well as in the smaller cities and towns for the purpose of teaching illiterate chauffeurs, of which there are many, to read and write. An opportunity will also be taken in the classes to determine whether or not the chauffeur is mentally and physically fit to be entrusted with a public vehicle of the potentialities of the automobile.

MEDICAL SOCIETY OF LA PAZ, BOLIVIA

Several prominent physicians of the city of La Paz have recently organized themselves into a medical society for the purpose of improving the medical profession by means of scientific meetings and discussions and the presentation of the clinical cases for study. The society will publish a medical bulletin and will cooperate with the Government in the preparation of a sanitary code and in carrying on a popular propaganda for public health.

ANTISMALLPOX CAMPAIGN

The Bolivian Red Cross recently designated a number of its nurses for the purpose of vaccinating all pupils in the girls' schools of La Paz. This was done with the dual idea of controlling smallpox and increasing the public appreciation of vaccination.

URUGUAYAN BACTERIOLOGICAL INSTITUTE

Professor Kurt Schern has been engaged by the Uruguayan Government as director of the Bacteriological Institute of the Montevideo School of Veterinary Medicine. Professor Schern, who has come from Germany to do this work, will, under the terms of his contract, lecture on infectious diseases and bacteriology and conduct research in the diseases of livestock. He will also be in charge of the work of manufacturing vaccines and antitoxic sera.

URUGUAYAN CHILD WELFARE

The National Council of Hygiene of Uruguay has created a special section of child hygiene which will have as its function the inspection and improvement of the health of young children. It will endeavor to collect and preserve birth and mortality statistics as applied to children and will make research into the causes of infant mortality and the means to be adopted for its prevention. The new section is taking active steps in the prevention of communicable diseases of children and has arranged for an annual baby week including public conferences and health competitions of children. The National Council of Hygiene is forming a League of Little Mothers

composed of girls over twelve years of age, who will be given vacation courses on the hygiene, care and feeding of young children. It is hoped that through this league mothers may be organized for the purpose of taking courses of practical demonstrations in the economical and proper preparation of dietaries for children.

THE WHITE SLAVE TRAFFIC

The President of Uruguay has approved a law whereby the Government of Uruguay becomes a signatory to the International Convention on White Slave Traffic signed at Geneva, Switzerland, on September 30, 1921.

PARAGUAYAN CHILD WELFARE

A program of child welfare which will bring into cooperation the services now existing in Asuncion, Paraguay, and add new functions was formulated in June by a special committee of medical practitioners. The program includes the appointment of four visiting nurses, the establishment of a prenatal clinic, a gynecological clinic in the National Hospital, the medical inspection schools and the free treatment of trachoma. The free milk centre and the pediatric clinic will be extended to include instruction in child care. Steps will also be taken in the protection of the control of tuberculosis in young children and in the prevention of ophthalmia neonatorum by the enactment of an ordinance making the use of silver nitrate in the eyes of all newly born children obligatory.

CHILDREN'S HOSPITAL

Quito, Ecuador, has taken the initial steps looking to the erection of the Baca-Ortiz Hospital for poor children made possible by a donation from Mr. Hector Baca. There has recently been created in the Republic the Ecuadorian Child Welfare Committee, largely through the efforts of Miss Suzanne Ferriere, general secretary of the International Union of Child Welfare. On the occasion of her recent visit to Ecuador, she was unanimously elected the honorary president of the new society. Another movement which is serving to increase child welfare is the establishment of Leagues of Kindness in the public schools of Ecuador. The membership is confined to school children, who bind themselves not to lie, to protect the weak, comfort the unhappy and respect the aged and sick, and to be polite and courteous, and to be kind to animals. Anyone who has traveled in Latin America has been struck with the excessive brutality and cruelty with which domestic animals are treated. Many of the best thinkers of Latin America have come to the conclusion that there can be no really large advance in public health work until this is overcome because man cannot realize the sacredness of human life and health unless he has first a proper idea of the necessity of protecting the health of lower animals and treating them kindly.

CHILD WELFARE IN BRAZIL

The Child Welfare Institute of Rio de Janeiro, which was founded twenty-five years ago by Dr. Moncorvo Filho, established in 1921 a prenatal and infants' dispensary. During the three years of its existence it has treated several thousand women and babies, has performed many Wassermann tests and given treatment for venereal diseases where indicated. It is stated that the work of this institution has reacted very favorably on the health of children in Rio de Janeiro.

CHILE'S ADVANCE IN CHILD WELFARE

For several years child welfare has been receiving increased attention in the larger cities of Chile, notably in Santiago and Valparaiso. Arrangements have recently been made whereby the Manuel Arriaran Hospital will care for tubercular children. Similar arrangements have been made with the hospital of San Jose. The San Jose de Maipo Sanitorium is not yet open, but as soon as sufficient funds for its operation are provided, it will be put in operation since it is located in a climate which is believed to be very favorable to the treatment of the disease. In Santiago the *gotas de leche,* or free milk stations, are continuing their operation in the issuance of milk to children, the vaccination of children against smallpox and the treatment of mothers and children for syphilis. Maternity care is provided in the *asilo maternal* or maternity house. The baby's layette section provides clothing for poor babies and the *marmita* or free lunch section provides lunches for poor school children. On June 21, 1924, the president of the National Council of Women, Dr. Ernestina Perez, began a series of lectures on child care in the public schools of Santiago.

VIENNA LETTER

(*From our own correspondent*)

Vienna, *October 31, 1924.*

NEW SUBJECTS IN THE VIENNA UNIVERSITY CURRICULUM.

The new semester of the Vienna University has brought, besides the obligatory and conventional lectures, a whole series of new lecturers and new subjects. Only a few chairs are vacant, and these on the medical faculty. An interesting new subject is the series of lectures on the Essence and Development of the German National Genius. The lectures are open both to students and nonstudents and to all faculties. Another series of lectures will deal with the Justification and Limitation of the National Moments in Culture and Education. A new feature is the introduction of lectures on radiotelephony, which will be delivered by Professor Haas and can be attended by all classes of students. Professor Schmidt will lecture on the Study of Climatics in the Alpine Countries, Professor Reche announces a series of lectures on Anthropological Practicum, and Professor Czermak on the Races and Languages of Africa. The Vienna University had 8,074 students in 1923; among these 2,212 law students (seventeen women), 2,380 medical students (348 women), the philosophical faculty has been attended by 2,205 students (549 women), 156 Catholic theological, and sixty Evangelical students (two women). Out of the total number of students there were 1,072 special students.

THE VOICE OF FAMOUS MEN

In the uppermost story of the physiological institute of the Vienna University two rooms are oc-

cupied by the collection of phonographic records of the Scientific Academy, a very rich collection of records. There are records reproducing the sighing of the wind, the howling of a beaten dog, the shrieking of starving cannibals, and also beautiful airs sung by artists, whose vocal organs are the wonders of the human organism; songs of notable actors and actresses, speeches of diplomats, the monotonous talking of the late Kaiser Francis Joseph, and selections from the lectures held by prominent members of the professorial board of the Vienna University. The voice of every medical professor is preserved and also that of prominent students; also the foreign guests of the University and particularly that of the medical faculty. Notable among them is the record of Professor Einstein. He speaks gravely even into the phonograph. His voice is hard and sounds like the program speech of a candidate before the elections. Rabindranath Tagore could not be persuaded to speak into the machine. He wanted to sing only his own poems. Thus the record has perpetuated Indian songs, that nobody understands.

A NEW METHOD OF NARCOSIS

In some of the Vienna surgical clinics a new method of narcosis is being experimented with. The method started in Paris. Dr. Fredet intended to confirm on ground of accurate measurements, out of the diverse narcotizing drugs, which one is the best economizer of chloroform. The most advantageous drug proved to be somnifen, a mixture belonging to the veronal group, and up to now it has been chiefly used by midwives. This drug, somnifen, if injected into the vein is capable of lessening the amount of chloroform by fifty to sixty per cent. and finally to one hundred per cent., that is, even in operations of long duration chloroform could be dispensed with. The whole method of Fredet is nothing else than giving a preliminary morphine-scopolamine injection followed by an intravenous injection of somnifen to the patient to be operated on. The procedure is quick and simple and is advantageous from the point of view of the operating surgeon, because it is not necessary for him to divide his attention between operation and narcosis; he requires fewer assistants and the operating theatre is devoid of the noxious ether and chloroform vapor. From the point of view of the patient it is to his advantage that he need not fast before operation and postoperative vomiting does not occur. The experiences of the Vienna surgeons have not yet been published but it is hoped that their results will be at least as favorable as those of the French surgeons who use this method extensively.

BRUTAL MURDER OF A DOCTOR

In the town of Türunitz, in the vicinity of Aussig, the town physician, Dr. Anton Quoika, sixty-six years of age, has been murdered in a brutal manner. In the waiting room of his office there were about ten patients. As the doctor did not commence his consultations at the usual time the patients became impatient, and opened the office and found the old, jovial doctor on the floor, in a great pool of blood. He had received five mortal blows on his head, which had been inflicted by the leg of a stool. The culprit escaped. On the same afternoon the murderer, a late patient of the doctor, was arrested. He knew that the doctor's family was absent and that he was alone and murdered him to rob him.

THE DEATH OF PROFESSOR WILHELM ROUX

This celebrated anatomist, who has been teaching anatomy also in the University of Vienna, died in his seventy-fourth year of age. He was born in Jena, Germany, and studied in Germany, having been recognized as an extraordinarily ambitious student of the late Professors Ernst Haeckel and Rudolf Virchow. He was promoted to the rank of doctor of medicine in 1877 in Jena, and afterwards studied natural sciences for a year and then published his first dissertation on the Ramification of the Blood-vessels. This work aroused the interest of the whole medical world and at once made his name world famous. His greatest work was *The Fight of the Parts in the Organism.* This work was so important that Charles Darwin declared it as most important for the building up of his theory of the history of development. After having completed his researches he occupied in 1880 the chair of anatomy in the University of Breslau and in 1886 he came back to the Innsbruck (Austria) University, where he stayed till 1897. Then he was invited to the University of Halle, where he stayed until his death.

MASS POISONING CASES IN AN INFANTS' HOME

In the Country (Lower Austria) Infants' Home in Baden (not far from Vienna), two children fell ill with diphtheria. The rest of the children who came in closer touch with these, altogether thirty-six of them, have been duly immunized by having been inoculated with toxin-antitoxin mixture (according to the method of Professor Kassowitz, of the Vienna University). After seven days seven children have shown serious reactions. Six of them died during the period from September 16-29, despite the medical aid which was given them promptly. All manifestations pointed to poisoning. The postmortem examination, carried out by the city police pathologist, declared that all the six cases were poisoning with diphtheria toxin. The inoculated serum was supplied by the Serotherapeutic Institute in Vienna. The case did not get into the papers until the end of October, when the lay press handled it with such animosity that Professor Pirquet had to write on the subject in a leading daily paper. The investigations resulted in the finding that the Serotherapeutic Institute, owned by another company, had been very careless in the handling of the serum. It had been sold without the date of expiration of efficacy having been printed on the label. The stoppers of the bottles containing the serum left much to be desired; in some cases they did not close the bottles completely. The medical papers have urged the passing of a law that only the state shall be allowed to manufacture sera and vaccines, under the control of the expert professors of the university, and then such occurrences will surely be avoided. In consequence of this sad occurrence the confidence of the public in vaccines and sera has been very much shaken so that doctors have difficulty in persuading parents that this case was only an unfortunate accident.

Book Reviews

TREATMENT OF TUBERCULOSIS

Handbuch der gesamten Tuberkulose-Therapie. By Prof. Dr. Ernst Loewenstein. Band II. 190 Illustrations. Berlin und Wien: Urban & Schwarzenberg, 1923. Pp. 1,000.

It would be impossible to review each and every one of the numerous chapters in this volume, so all that can be done is to refer the student to the marvelously complete descriptions of the various phases of tuberculosis science. Nearly two hundred pages are devoted to the specific treatment of tuberculosis. The author seems to favor the new tuberculin (Bazillen emulsion) and the albumen free tuberculin. In no textbook on tuberculosis, at least not to the knowledge of the reviewer, are the complications of pulmonary tuberculosis or the primary tuberculous infections of other organs so thoroughly treated as in this textbook. The late Prof. Zuckerkandl, of Vienna, gives an excellent description of tuberculosis of the kidney and bladder, and Lichtenstern does the same for tuberculosis of the prostate and testicles. Under tuberculosis of the skin by Professor Volk, besides the treatment with the aid of tuberculin, we see mention made of chemotherapy, surgical methods, heliotherapy, phototherapy, x ray treatment, radiotherapy and local freezing treatment. With the same thoroughness is described the treatment of the tuberculous female genital organs and tuberculosis of the eye, nose, mouth, pharynx, and larynx.

The surgical treatment of pulmonary tuberculosis, including artificial pneumothorax, is thoroughly gone into by numerous authors. The late Prof. Chr. Saugman, of Denmark, contributed an excellent essay on the technic of artificial pneumothorax. In the historical review of this treatment, it is gratifying to see credit given to our late Murphy of Chicago, for European authors are likely to forget the fact that Murphy was a pioneer of artificial pneumothorax fully as much as Forlanini. There is nothing new advanced either in the technic or in the indications or contraindications for artificial pneumothorax. The conclusions as to the results, given by Prof. Carpi, of Milan, are interesting, although not corroborated by many observers. Carpi maintains that pneumothorax can definitely cure pulmonary tuberculosis, that the treatment can be stopped after a relatively short time, and that the phthisical lung, cured in this way, can resume its function if it had been allowed to remain at rest long enough. According to him, pulmonary tuberculosis can be lastingly treated and cured in shorter time by this than by any other method. He gives the average time necessary to obtain an absolute cure as six months according to Feldmann, and eight months according to Saugman.

As a relatively new contribution brought out in this volume we must mention endocrinology in tuberculosis by Prof. Wiesel. He considers Addison's disease to be most likely of tuberculous origin, but at the same time admits that there does not exist any specific treatment for this affliction and that tuberculin injections are useless. Tuberculosis of the pituitary body he believes to be of relatively rare occurrence but states that the toxin created by the tubercle bacilli is often responsible for symptoms which may be ascribed to a disturbed function of the hypophysis. Among the curative measures for intestinal peritoneal tuberculosis it is surprising to miss the heliotherapy and phototherapy which, in the hands of the American specialists, have given such satisfactory results in these afflictions.

To the student of surgical tuberculosis the chapter on orthopedic therapy in this volume will be interesting although I question that any of the methods described are superior to those in vogue in our best orthopedic American hospitals in which röntgenotherapy in tuberculosis of bones and joints is resorted to, quite a good deal. It is surprising that heliotherapy has received no mention whatsoever in this book in spite of the wonderful results which are obtained in bone and joint tuberculosis by Rollier and his disciples.

Of interest is the chapter on chemotherapy in tuberculosis, that is to say, chemical substances to which are ascribed indirect influences on the tuberculous process. Here are mentioned calcium silicate, arsenic, gold and copper preparations, creosote and chaulmoogra oil. Regarding the value of all of these substances, I wish to translate as nearly as possible the concluding words of this chapter written by Prof. Loewenstein himself, which read: "Concerning all these preparations, ye may say that at any rate we do not as yet stand on a sound foundation and much more research is necessary before we may even say we are working in the right direction."

The concluding chapters take up the treatment of tuberculosis at home of adults and children and give prescriptions for the symptomatic treatment of tuberculosis. Some statistical considerations of tuberculosis in tropical regions make an interesting finale of a very large, highly interesting and instructive volume—too large for the perusal by the general practitioner, but invaluable for the specialist and the student of the tuberculosis problem in all its phases.

THE EYE IN PULMONARY TUBERCULOSIS

Inégalité Pupillaire et Tuberculose Pulmonaire. By Dr. W. Jullien. Paris: Amédée Legrand, 1923. Pp. 117.

The author of this book, upon the suggestion of Prof. E. Rist, of Paris, made a thorough study of the value of the inequality and dilatation of the pupils as a diagnostic means in pulmonary tuberculosis and also to see if it might be a possible guide in the performance of artificial pneumothorax. The frequent dilatation of the pupils in pulmonary tuberculosis on the affected and sometimes on the opposite side, has of course been observed for years, but only recently has it been affirmed that this sign might be a guide as to which side presents the pleuritic adhesion, and whether or not and to what extent artificial pneumothorax may be practical. The dilatation of the pupils is explained by pressure arising from tubercles or adhesions on the branches of the sympathetic nerve.

The author precedes his arguments and clinical proofs by a chapter on the innervation of the iris and then proceeds to interpret the many physiological causes which may be responsible for the inequality of the pupils. He also gives a modus operandi of the various means to bring about a temporary dilatation or contraction of the pupils and a method of measuring the inequality, if it exists. Lastly, photographs are reproduced of the eyes of a number of tuberculous patients, showing the pupils and at the same time giving the x ray photographs of the chests.

His conclusions, based upon the careful observation and study of seventy cases in the Laennec Hospital and the Leon Bourgeois dispensary in Paris, are as follows: An inequality was found in twenty-six per cent. of the cases of unilateral tuberculosis; it was also shown that apical lesions are not always productive of a dilatation of one of the pupils, and it is hardly ever found when the lesions are near the hilus or at the base of the lungs. The study of other cases has also shown that in nontuberculous affections attacking the parenchyma of the lung, such as bronchiectasis when accompanied by sclerotic tissue, in cases of neoplasms, hydatid cysts, and even in gangrene of the base of the lung, dilatation of the pupils has been observed. This very careful study shows the relatively small value of the dilatation of the pupil as a diagnostic means in pulmonary tuberculosis. Jullien's work will nevertheless always remain an interesting contribution to our knowledge of the subject.

MENTAL DISORDERS

Mind and Medicine. By Thomas W. Salmon, M.D., New York: Columbia University Press, 1924. Pp. 33.

A few pages have been found in such an attractive and durable form that they should carry their message throughout the medical profession. The author has presented a challenge to his fellow professors and his students, in the address reproduced here, which is no less a matter for thought everywhere. Medicine, he states with just pride, has made marvelous advance in investigation of the organic basis of disease. Nevertheless, it has been so carried away with the fascination and the value of these discoveries that it seriously neglects the far more widespread functional problems which lie in mental disorders and in the social disabilities which follow. Medicine, for the greater part, has gone brilliantly on its way, turning a cold shoulder to this field, the pressing problems of which have proved themselves in need of medical understanding and aid most of all. Salmon points out what has been done by the few who have turned their earnest attention in this direction, and that this is only indicative of all that still remains for the more determined undertaking of the medical profession. It is not a matter for a few special groups; it has been that too long. The mental phenomena are inescapable phenomena in the field of every practitioner and should be within every curriculum, if any and every patient is to be known and treated in his total reactions, if, in fact, the physician is to consider either himself or his patient in the total of the social environment.

HUMAN CONSTITUTION

The Human Constitution. A Consideration of Its Relationship to Disease. By George Draper, M.D. With 208 Illustrations and 105 Tables. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 345.

The practical application of anthropological data as found in the individual in relation to his tendency to certain diseases is the object of this study. The work is a worthy one and Draper has done much to lay a workable foundation. This work is only a bare outline of what may be filled in by future workers. Data of this kind should be more sought after especially in hospitals and other large public institutions. Not only is there value in it from the viewpoint of medicine but there should also be gained data of infinite value to the study of genetics, longevity, and heredity. Draper has displayed originality in working out certain formulas and their relationships. The work is a commendable one.

PATHOLOGY

Lectures on Pathology. By Ludwig Aschoff, M.D. Delivered in the United States, 1924. With Thirty-five Illustrations. New York: Paul B. Hoeber, Inc., 1924.

These lectures, delivered in various parts of the country before medical associations, colleges, and academies, in the spring of this year, range in subject from the concept of inflammation to atherosclerosis, thrombosis, and the origin of gallstones. Naturally, their reading is, as some one said of the dictionary, most interesting but slightly disconnected. Aschoff has an open mind and, of course, a well informed one, on the subject of endocrinology and, for this reason among many others, the perusal of his Lane lectures (San Francisco) on the normal and pathological morphology of the suprarenals, and that on ovulation and menstruation is recommended to some of our doubting Thomases who refuse to admit that a thing exists until it is thoroughly explained. One of the most instructive lectures is a review, in the light of the most recent investigations, of renal secretion and renal diseases.

ACQUIRED CHARACTERISTICS

The Inheritance of Acquired Characteristics. By Paul Kammerer. Translated by A. Paul Maerker-Branden. Illustrated. New York: Boni and Liveright, 1924.

Kammerer states his case and to many biologists proves it. Others in defense of certain pet theories find this difficult. The reader of this book will find much to think about for Kammerer is not finished with a proof of his theories, he goes on and applies them forensically, materially and individually. No matter what opinion the reader may hold he should find much to inspire individual thought.

CHOREA

Les Chorées. Par Dr. Babonneix. Bibliothèque des Connaissance medicales, dirigée par le Docteur Appart. Avec 34 figures dans le texte. Paris: Ernest Flammarion, 1924.

This small book should be of value to the neurologist. Babonneix has done a great deal of careful work on the choreas. If he offers little that is new at least he has organized the various choreas in a sequential manner. Of principal value is the setting forth of the differential diagnostic, and the underlying pathological conditions found in Sydenham's, Huntington's and other choreas and choreiform movements.

THE OLD TESTAMENT

The Literature of the Old Testament in Its Historical Development. By Julius Bewer. New York: Columbia University Press, 1924. Pp. 452.

This work of Bewer's edited by Shotwell is a real contribution. A reading of this carefully compiled series of analytical researches will animate the Old Testament and by so doing will give the reader an historical concept of the material which it contains. In this way the Old Testament becomes an epic gathered from the songs, poems, narratives, fables, proverbs, oracles, laws and other primitive fire cords. The work has been done with meticulous care and in the eyes of the reviewer serves a more useful function than would the work as the author first planned it. The anthropologist as well as the student of human endeavor with its attendant problems will welcome this volume. It is a good companion to Frazer's work on the Old Testament.

THE BAINBRIDGE FAMILY

Yesterdays. By Lucy Seaman Bainbridge. Illustrated. New York & Chicago: Fleming H. Revell Co., 1924.

In writing and publishing this little book, the author has benefited and given a document of special interest not to her grandchildren alone, as was her purpose, but to the members of the medical profession, to whom the name of "the boy," William Seaman Bainbridge, stands high on the list of surgeons of this country and of American physicians who have held important official positions in the United States and as representatives of the country abroad. Dr. Bainbridge was sent as delegate from the United States to the *Congres International de Médecine et de Pharmacie Militaire* held in Brussels in 1921 and also to the meeting of the *Comité Permanent* in 1922. Interest in things foreign and far afield was, it seems, a traditional characteristic of his mother's family. "The love of home and desire for travel seemed always in conflict," writes Mrs. Bainbridge, who was herself a great traveler, as those know who have read her books, *'Round the World Letters* and *Jewels from the Orient.*

"'The little house says "stay":
The little road says "go."'"

Her father, "the boy's" grandfather, was of Quaker origin, and maintained throughout his life the utmost simplicity and principles of the highest integrity. He was one of the founders of the firm of Seaman & Smith, leading boot and shoe manufacturers of Cleveland, Ohio.

His wife, in days when it was considered a discredit to a woman to study medicine, entered the field and graduated as a physician. When the Western Homeopathic College in Cleveland finally, after much opposition, consented to admit her to lectures, she was put by herself in the gallery with an armchair and a footstool; "but many a friendly smile was sent up to her from below, and she was called the 'guardian angel.' She made the most of their good fellowship and invited the class often to bountiful suppers at her home. . . ." When she began to practise, she set aside in her home "the Lord's Room," which was nearly always occupied by a patient, a poor student, or someone in sorrow. It was largely through her zeal and influence that the first woman's medical college was organized in Ohio, and she was its first president. During the second year of its existence, the Seaman Free Dispensary was established, and occupied a room in the college building under the control of the faculty. No wonder that her daughter, Lucy, visiting in Washington in 1864, and hearing of the need for nurses at the front—there were no trained nurses in those days—went there at once. "There was no pretty nurse's cap or white uniform to wear, but just plain, everyday clothes—a gingham dress and apron; no dainty and becoming white veil with a red cross over my forehead or on my arm. My distinguishing mark was simply a badge of red silk pinned on my left breast, on which were printed in gilt the words 'Ohio Relief.' Thus I went down the Potomac . . . At Port Royal on the Rappahannock, White House Landing on the Pamunkey, and, finally, at City Point, I had experiences of war which memory will never lose. How much was accomplished is a problem for the arithmetic of eternity." A night when Clara Barton visited the camp and shared "Sister Ohio's" big blanket shawl and log pillow, glimpses of Lincoln and Grant at the front, and other wartime episodes are described with a simplicity and vividness that testify to Mrs. Bainbridge's unusual ability as a writer. A delicious sense of humor is always present, from the time when the little red headed girl "got back" at the boys who had teased her about her fiery hair, to the last page of the book, describing a visit to Dublin, where three statues adorn the Post Office. These are pointed out to the tourist as the Twelve Apostles. "But where are the other nine?" is the natural question. And the answer: "Inside sorting the mail."

The comments on places and people encountered during the trip 'round the world made by Mrs. Bainbridge and her young son are delightful, and full of unusual and interesting bits of information, such as that of the village in China that was suffering from a drought. The inhabitants were dragging an idol through the streets, raising a terrible cloud of dust as they progressed. "Now," they were telling the idol, "that your eyes are full of dust, you can know how it is with us."

PLAGUE YEARS

Fortune's Fool. By Rafael Sabatini. Boston: Houghton, Mifflin & Company, 1923.

A simple enough tale of the exigencies of living and loving in London during the great plague. It has its picturesque moments, and by novelty the heroine rides in a sedan chair! Randall Holles, toughened veteran of many wars whose sword service is not desired by his country—Sylvia Farquaharson, the reigning state favorite, virtuous even in those days of the stage's disrepute, greater and lesser lights in England at the time of the war with the Low Countries,—all flit through the pages of Sabatini's romance, easily and gracefully. In due time we shall see them on the screen. And ere long perhaps we shall meet them again, against another historic setting, in another crisis, tearing out their hearts with the same old, ever-new fervor that "gets" the public. Harmless and amusing—true to life—perhaps! At any rate a faithful mirror of the favorite types foisted upon well meaning authors by clamorous audiences.

Medicoliterary Notes.

Lea & Febiger, the well known publishers of medical works, have recently moved into their new building on South Washington Square, Philadephia. The completion of this building marks the one hundred and fortieth year of the firm's existence, for it was established in 1785, antedating the Constitution of the United States by four years, and has been in continuous operation ever since. One of the founders of the firm was the recipient of an unsolicited check from Lafayette to aid in the establishment of the business. In its earlier days, Lea & Febiger published, among other notable works, Wemyss's biographies of Washington and Marion, Jefferson's *Notes on Virginia,* and American editions of the Waverley novels, Dickens, Washington Irving, Fenimore Cooper, and the *Encyclopaedia Americana.* Later it began specializing in medical works and has since continued in this field. For sixty-six years it has been the publisher in this country of *Gray's Anatomy,* and of the *American Journal of the Medical Sciences* since 1820. For many years Lea and Febiger were the publishers of the *Medical News,* which was incorporated with the NEW YORK MEDICAL JOURNAL in 1906.

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Everlasting Life: A Creed and a Speculation, is the title of a little book written by Dr. W. W. Keen and recently published by Lippincott. It is a brief but vivid story of how Dr. Keen passed through an anxious period of doubt and distress and emerged into "a broader, happier, sunny belief in the goodness, mercy and love of God, into a real, glorious belief in the Atonement by our Divine Lord and Savior Jesus Christ, who was 'Son of God' and also 'Son of Man!' Hence this little book with this glorious Christian Magna Charta."

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In the *National Geographic Magazine* for November, Major Robert Whitney Imbrie has an interesting article on *Crossing Asia Minor, the Country of the New Turkish Republic.* He writes: "If your digestion and nerves will not stand almost continual coffee drinking—the thick, black, syrupy coffee of the Orient—and endless cigarette smoking, venture not into the Near East. No business is ever transacted, no social call is complete, no meeting, however casual, is ever terminated without tobacco and coffee. One must be prepared to drink at least one dozen, and perhaps two dozen cups of coffee a day and consume many cigarettes if he is to get along on this trip. Of course, if one can smoke the nargile, or Turkish pipe, so much the better, but if he can, he is a better man than I am. Twice have I essayed to master this quaint instrument, and on both occasions interest was not all I lost. It leaves a feeling as if one had been smitten with what the newspapers describe as 'a dull, blunt instrument.'"

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Because of the many inquiries received at the New York quarantine station as to the importation of dead bodies, a statement of the general requirements governing the intrastate and interstate transportation of such bodies has been prepared in Washington, and published in *Public Health Reports* for October 31st.

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Because of temperature expansion and contraction, the Washington Monument, it has been estimated, is about five and a half inches higher in summer than in winter.

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The American Relief administration has recently issued a bulletin carrying the detailed account of the distribution of the food remittance packages in Russia, of the relief measures for the nation's brain workers, and the resultant earning of funds for feeding three million children.

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The first volume of Gabrielle d'Annunzio's three volume autobiography, entitled *Le Faville del Maglio,* is out. This volume is called *Il Venturiero senza Ventura,* and contains a spectacular dedication to Eleonora Duse, whose love was the inspiration of the writer's art. The page following the title page bears the inscription: "I am what I am by the grace of God."

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The *Nation's Health* for November contains an interesting article on the *Maintenance of Interior Lighting Systems.* Experience indicates, it is stated, that often more than thirty per cent. of the light paid for goes to waste through inattention to maintenance requirements.

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One of the recent publications of the Yale University Press is *Organic Adaptation to Environment,* edited by Malcolm R. Thorpe. It comprises papers on the subject by eight authorities.

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In the Manhattan section of New York there have been more than one hundred deaths in a single year due to falls on stairs. The total number of such fatalities in the United States is estimated to be about 14,800 each year. The majority of these falls are due either to slipping or tripping, the former being far more prevalent. About eighty-five per cent. of accident on stairs occur during December, January and February. This is due to snow, ice and poor lighting.—*Nation's Health.*

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The one hundred and twenty-fifth anniversary of the birth of Alexander Pushkin, greatest of the poets of Russia, is being celebrated in that country.

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Dr. Mikkel Hindhede, a Danish nutrition expert, has recently added another book on improper food and eating habits as the leading cause of cancer's increased death rate. He warns against overeating and rich foods.

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"Books," the *Herald Tribune's* literary supplement for October 26th, contains a review of unusual interest of Dr. Paul W. Harrison's recent book, *The Arab at Home.* "The author's twelve years in Arabia have led him to the conviction that the one thing men want is equality. He has put his finger on the sore spot of the world."

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An exhibit of six thousand specimens of insects and related organisms which exert disease producing action on human beings and animals is on display in the Vienna Museum of Natural History. The entire life cycle, as far as is known, of each specimen is given. Those wishing to study the collection are furnished with expert guidance for a week. The exhibit is divided into groups according to the method in which the insects produce the various diseases —whether by means of gland secretion, by hairs, by poisonous appendages, by bloodsucking, or by transmission of disease germs.

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Eyeless Sight: A Study of Extraretinal Vision and the Paroptic Sense, by Jules Romains, translated from the French by C. K. Ogden, is one of Putnam's recent publications.

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A report of a case of apparent arrest of leprosy by early surgical treatment, by Dr. William J. Goodhue, medical superintendent of the Molokai Leper Settlement, and Dr. H. E. Hasseltine, of the U. S. Public Health Service, is given in the October 24th number of *Public Health Reports.*

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A recent addition to the *Mind and Health Series,* edited by Dr. H. Addington Bruce, is *Controlled Power,* by Dr. Arthur Holmes.

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On September 16th a bronze bust of Louis Pasteur was dedicated at the American Institute of Baking in Chicago. This bust was presented to the Institute by the Carlsberg Fund and the directors of the Carlsberg Glyptotek and the Carlsberg Brewery at Copenhagen. The presence of this bust at the Institute will serve as a continuous reminder of the great Pasteur's contributions to the technology of baking.—*American Journal of Public Health.*

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The first Turkish novel to appear in English has recently been published by Duffield & Company of New York. It is entitled *The Shirt of Flame* and the author is Halide Edib Hanum, who was the first Turkish graduate from the American School for Girls at Constantinople. The scene is laid at the time of the Revolution, and there are vivid descriptions of battles and hospital scenes, but the book is perhaps most valuable as expressing the point of view of the Turkish "new woman."

Abstracts from Current Literature

TUBERCULOSIS

Calcium Metabolism in the Tuberculous.—M. P. Weil (*La Médecine,* May, 1924) states that the decalcification known to exist in tuberculosis through analysis of the tissues and experimental investigations is due rather to reduction of the power of the tissues to fix calcium than to insufficient ingestion of calcium salts. The percentage of calcium in different foods and in the waters in different localities varies enormously. Vegetable foods are rich and meats poor in calcium. Elimination of calcium takes place through the bowel, kidneys and mammary secretion. The greater the amount of alkalies in the diet the greater the ratio of calcium elimination through the bowel as compared to that through the kidneys, insoluble calcium salts—phosphates and carbonates—forming more readily in the bowel under these conditions. If the diet is acid, on the other hand, soluble calcium compounds are formed which are easily absorbed by the bowel and eliminated through the kidneys. Renal elimination of calcium also increases with the amount of acid secretion in the alimentary tract. Calciuria, often an inherited condition, is, as a rule, merely an expression of phosphaturia, due to exaggerated conversion of insoluble dicalcium to soluble monocalcium phosphate. Urinary decalcification is often merely an outward evidence of dephosphatization. An adult on a vegetable diet, without water, milk or eggs, takes in at least 0.15 gram of calcium a day, whereas a milk diet may result in the ingestion of as much as seven or eight grams. Growing individuals require much calcium, but adults need only 0.2 to 0.5 gram in calcium oxide. Insolubility of calcium salts is not an absolute bar to their absorption, but absorption is much better if the calcium is taken in organic compounds, as in vegetables and milk. A colloidal condition of the calcium, as in fresh plants, seems powerfully to favor its assimilation. The insufficiency of calcium fixation in disorders attended with decalcification is related to an insufficiency of certain necessary sensitizing agents, viz., the internal secretions, vitamines and light. The effect of adrenalin in osteomalacia is well known, and Sergent lays stress on the conjoint use of adrenalin with lime salts in the tuberculous. The gonads, thyroid, thymus, and perhaps in particular the parathyroids, also exert a considerable influence. The fat soluble vitamine A has an extremely marked fixing property in relation to calcium; this applies to codliver oil, which is especially rich in vitamine A. Light, especially sunlight and the ultraviolet rays, has a similar property. A normal subject, sufficiently exposed to light, with properly balanced internal secretions and receiving a diet of normal vitamine content, will thrive on the simplest mineral calcium compounds and consequently even more so on the semiorganic lime supplied in the ordinary diet. On the other hand, an impoverished, debilitated body, living under poor hygienic conditions, should be given the lime it lacks, in order to reduce to a minimum its work of assimilation.

Typhoid Activity and Tuberculosis.—E. Coulaud (*La Médecine,* May, 1924) notes that certain clinicians, struck by the fact that goitre cases showed a special resistance to tuberculous infection, concluded that thyroid activity antagonized such infection and advocated the administration of thyroid extract or iodine in tuberculosis. As a matter of fact, however, the size of the thyroid gland is not an index of its functional activity. Hamburger and Betz observed that the development of goitre during tuberculosis was a prognostically favorable occurrence and also noted frequent tuberculous flareups after treatment of goitres with iodine or by surgical means. The author, among large families living under poor hygienic conditions, has repeatedly found seven or eight cases of tuberculosis out of about thirty individuals belonging to three generations; the goitrous subjects, even though often sleeping in the same bed with tuberculous sisters, were always free of tuberculosis. Hypothyroid and myxedematous individuals exhibit a resistance to the disease. The problem is more complex as regards the relationship of true exophthalmic goitre to tuberculosis, as tuberculosis appears to be uncommon in such cases. The explanation offered is that true exophthalmic goitre is a dysthyroidia, which may actually coexist with myxedema. In the less advanced, incomplete Basedow syndrome, however, pulmonary tuberculosis is rather commonly met with. The periods of physiological thyroid overactivity in the female, viz., puberty, menstruation, delayed menses, pregnancy, and the menopause, are critical periods in respect to tuberculosis, Ingestion of thyroid extract aggravates active tuberculosis, and the author has seen many patients in whom tuberculosis appeared after prolonged ingestion of thyroid. Pathology confirms these views in that the thyroid gland in tuberculous cases is generally found in good condition and free of fibrous change. Rabbits in which the thyroid has been exposed to the x rays sufficiently to cause a lasting deterioration of the gland prove more resistant to tuberculosis than controls, in spite of the deleterious effect of the rays on the body as a whole, evidenced by loss of weight after each exposure. To eliminate this factor the author experimented with the offspring of rabbits in which the thyroid had been exposed to the x rays. In such litters the thyroid gland shows modifications easily recognizable histologically. Whereas the controls succumbed to tuberculosis in three months, some of the animals of the special litters showed little evidence of the disease at the end of a year. Cordier observed that a rise of basal metabolism in tuberculous cases was prognostically unfavorable. Jacquerod, giving goitre extracts to tuberculous cases, observed rather favorable effects, whereas the ordinary thyroid extracts are distinctly harmful.

Tuberculosis of the Bronchial Glands in Infancy.—E. Wieland (*Schweizerische medizinische Wochenschrift,* February 21 and 28, 1924) asserts that the clinical symptomatology frequently is of no avail in the early stages, nor is röntgenology always a reliable diagnostic aid. In addition to perfect exposures with soft tubes, it also requires free exposures in different directions in order to expose to view the lymph nodes at the bifurcation of the trachea, which are covered by the middle shadows. Any pathological shadow formation found must be differentiated from circumscribed tumors originating from other thoracic viscera and particularly from inflammatory, acute swellings of the lymph nodes occurring not infrequently after infectious diseases. However, the latter is possible only with the aid of the von Pirquet cutaneous test or of the intradermal tuberculin reaction. In general the prognosis is not unfavorable.

Organic Arsenic Compounds in Pulmonary Tuberculosis.—John Guy and G. B. Page (*Lancet,* April 26, 1924) endeavored to determine whether the modern organic preparations of arsenic offer any advantages over the older compounds, particularly in pulmonary tuberculosis. Novarsenabenzol was given intravenously in weekly doses of 0.3 or 0.45 gram up to six injections, the course being repeated after an interval of a month in some cases. Sulpharsenol was given intramuscularly in three different doses, the second proving the most useful, viz., a purely tonic course of six to eight injections weekly from 0.12 to 0.24 gram, a similar series of 0.30 gram after a smaller trial dose, and a course of biweekly injections such as might be used in treating syphilis.

The principal effects noted were those of the arsenic, but they were obtained more rapidly and in a more marked degree than in control cases treated with Fowler's solution added to an emulsion of codliver oil or with Blaud's pills with arsenious acid. After each dose there is an increasing tonic effect, a feeling of well being, sharper appetite, and returning strength. The improvement in the appearance, color, and weight of the patient is very marked. Anemia disappears more rapidly than under routine sanatorium treatment. The organic preparations of arsenic have no direct effect upon tubercle bacilli in any way comparable to their action upon spirochetes. The majority of patients showed an increasingly positive complement fixation reaction, but the significance of this is uncertain.

The types of cases suggested for this treatment are: 1, cases of extensive disease with some activity, where one would hesitate to use vaccines, but where there remains some prospect of producing arrest or extreme chronicity; 2,

ases which "hang fire" after a period of sanatorium treatnent; 3, cases in young adults with anemia, but otherwise avorable; the period of institutional treatment may be hortened thereby; 4, cases of double infection—syphilis and uberculosis; 5, as a therapeautic test in doubtful cases of ung disease. With simple precautions there is no risk; the nischief which may follow tuberculins cannot occur. The mprovement obtained is due to a general stimulation of the netabolic functions of the patient; there is no specific effect ipon the bacilli. Organic arsenic does not pretend to be anther new cure for tuberculosis.

Value of the Menstrual Reaction in the Determination of the Activity of Tuberculous Symptoms, Especially in the Lungs.—H. Maendl (*Wiener klinische Wochenschrift,* May 1, 1924) was enabled to obtain information regarding he activity and the extent of the tuberculous process through he lighting up of the tuberculous process in the lungs durng menstruation in seventy-seven per cent. of his cases. The occurrence of this phenomenon indicates a process that s active or likely to become active. He observed that auscultation during menstruation revealed dry râles at the pulmonary apices in women in whom no signs of apical catarrh was evident in the absence of menstruation. The author asserts that this test is an aid not only in the diagnosis, but it also indicates an active specific process.

Roentgenotherapy in Tuberculosis of the Bones and Joints.—Julius Hass (*Wiener klinische Wochenschrift,* May 1, 1924) states that roentgenotherapy promotes the production of cicatricial tissue and the inhibitive local powers. The amount and the nature of the irradiation are very important. The result is determined not by the hardness of he rays but by the amount of irradiation absorbed. There is no definite dose in tuberculosis and it must be gauged for the individual case. Excessive doses must be avoided. At first, it is well to begin with three skin unit doses (Holzknecht), which are then gradually increased until threshold focal reactions, such as increase of swelling and local increase of temperature, are produced. Only two thirds of he maximum dose should be given to avoid serious consequences. The author usually applies five skin unit doses hrough four mm. aluminum to every part in adults. Children require about one half to two thirds of this dose.

Tuberculin and Heliotherapy in Bone and Joint Tuberculosis.—W. A. Clark (*Journal of Bone and Joint Surgery,* October, 1923), draws the following conclusions from his three cases of bone and joint tuberculosis: In the three cases under tuberculin treatment the temperature was more regular and lower than it was before treatment was begun. Leucocytosis was stimulated in two of the three cases. No appreciable effect on the sinuses was noticed; these sinuses, however, were secondarily infected. Sunlight can penetrate he living tissues to some extent; this penetration is greater at higher altitudes than at sea level or intermediate levels. Direct sunlight inhibits the growth of tubercle bacillus. The course of the disease is shortened and the patient's general condition is better under heliotherapy than without it.

Direct Cultivation of Tubercle Bacilli from Spinal Fluids. Occurrence of Human and Bovine Types.—Ruth Gosling and John Montanus (*Journal of Experimental Medicine,* September, 1924) present data to show hat tubercle bacilli can be directly cultivated; that such ultivation is possible even when the number of tubercle acilli present is so small that they cannot be demonstrated n the direct smear of the centrifuged sediment; and their eries of cases cited shows the relative incidence of human nd bovine types in tuberculous meningitis, only three of orty-eight strains of tubercle bacilli isolated being of ovine origin. The sediments from thirty-four fluids were tudied, Dorset's and Lubenau's egg media being used or planting. Twenty-five of these thirty-four fluids, or 3.3 per cent., yielded positive cultures. The authors believe that direct planting of the sediment from cases of uspected tuberculous meningitis, where no organisms can e shown in smear, may have some value as a diagnostic rocedure, and that when guineapigs are used for the isolaion of strains of the tubercle bacillus from spinal fluids, specially when conditions are adverse to the proper care f the animals, due to overcrowding and incidence of epiootic diseases during the winter months, the planting of ome of the sediment directly upon egg media may be the neans of saving some strains for further study.

Treatment of Tuberculous Abscesses.—Siegfried Romich (*Wiener klinische Wochenschrift,* May 1, 1924), individualizes his treatment of tuberculous abscesses according to the stage of their development. Productive abscesses should be punctured repeatedly. The longer the formation of a fistula and the development of mixed infection is delayed, the firmer is the surrounding protective wall and the less dangerous is the infection. In the presence of mixed infection during the productive stage a wide incision is necessary. Cold abscesses require puncture, emptying of the pus and subsequent suture. With progressive healing and the formation of a firm membrane, the outlook for radical surgical intervention is improved, in which case a wide incision, the application of tincture of iodine and a compression bandage are indicated.

Overdiagnosis of Pulmonary Tuberculosis.—J. D. Adamson (*Canadian Medical Association Journal,* July, 1924), presents the following propositions. 1. Overdiagnosis is an evil, comparable in its results to underdiagnosis and correctly negating a diagnosis of tuberculosis though more disagreeable and more dangerous is as highly to be commended as is the finding of an early case. 2. Slight variations from what are conceived to be normal physical findings unsupported by posttussic crepitations, or xray shadows in the lung parenchyma are insufficient evidence of pulmonary tuberculosis even in the presence of general symptoms of debility and cough. 3. Occult tuberculosis, subliminal tuberculosis, peribronchial tuberculosis, *et hoc genus omne,* are not sufficiently proved to warrant their use as final diagnoses. 4. The presence or absence of localized, peripheral, parenchymatous shadows, in well taken xray films, is by far the most important point in making or breaking a diagnosis of early pulmonary tuberculosis. It is imperative that the clinician himself should have the facilities to search for and the training to recognize these radiographic changes.

Surgical Treatment of Tuberculosis.—H. Lilienthal (*American Journal of Surgery,* January, 1924), summarizes his findings as follows: 1. Surgery is not intended to supplant medicine in the treatment of tuberculosis of the lungs. It should be resorted to when medical and hygienic treatment have nothing more to offer and the patient's life is intolerable or the prognosis is grave. 2. Operation may have two distinct objects, first, the placing at rest of an entire lung and second, the obliteration of apical cavities. 3. Collapsing thoracoplasty, with phrenic nerve resection, puts the lungs at rest to a greater degree than is possible by any other known method. It is only to be applied when the other lung can function sufficiently to support life, and when it is not affected by rapidly developing tuberculosis. 4. Thoracoplasty does not take the place of therapeutic pneumothorax for no return of function is possible. In pneumothorax lung function can be restored, when desirable, in a large number of cases. 5. Arrest or great improvement following collapsing thoracoplasty may be expected in about seventy-five per cent of the cases. 6. The obliteration of apical cavities can be done on both sides of the chest. It is worth performing the operation when the disease in the remaining parts of one or both lungs is capable of arrest. 7. The operations here discussed are sufficiently safe to be recommended in properly selected cases. 8. The surgeon must never lose sight of the fact that although his wound may heal and his immediate objective be reached, his patient still has tuberculosis and will long require medical and hygienic treatment.

Treatment of Tuberculous Affections by Inflation with Oxygen.—The method recommended by Robert Purves and E. J. Bilcliffe (*British Medical Journal,* May 24, 1924), consists in evacuation of the abscess (by aspiration, trocar and cannula, or incision) followed by inflation by oxygen gas. The trocar and cannula are the best, but in deeply situated abscesses evacuation by free incision commends itself. Evacuation is frequently facilitated by changing the position of the patient. The apparatus required consists of oxygen in the usual cylinder, connected by tube to a wash bottle containing hydrogen peroxide; this is connected in turn by a tube to a hydraulic cannula, or to a Potain aspirator needle fitted with a two way tap which connects with the aspirator bottle and the suction syringe. A glass tubing containing a filter of sterile cotton wool is interposed midway. This with a coil of rubber tube on either side lies in hot water to warm the gas.

The aspirator or trocar should be introduced through sound skin, and if possible in such a manner as to produce a valvular closure on its withdrawal. If the abscess is evacuated by incision, the needle should be inserted at a distance from the incision after the cavity is evacuated. The incision is then closed in layers, if possible, before the gas is introduced. This procedure is contraindicated in the presence of sinuses or redness of the skin and of mixed infection. Tuberculous peritonitis with effusion has not shown good results. This treatment is easily carried out and can be given to ambulant patients. No unpleasant sequelæ have been seen.

Qualitative Variations of the Neutrophile Leucocytes in Pulmonary Tuberculosis.—Th. and J. Stephani-Montana (*Schweizerische medizinische Wochenschrift,* February 21, 1924) assert that the shape of the nuclei of the neutrophile leucocytes is significant in pulmonary tuberculosis. Comparative clinical and microscopical examinations show that those neutrophiles which show a rather extensive ramification of their nuclei prognosticate a favorable outcome, whereas those with more rounded nuclei indicate a more grave outcome.

Syphilis Simulating Tuberculosis.—George G. Ornstein (*Medical Clinics of North America,* July, 1924) states that hemoptysis, cough, expectoration, etc., are to be considered as caused by pulmonary tuberculosis until proved otherwise. The symptoms mentioned with negative röntgenographic and physical findings should suggest a possibility of syphilis. A positive Wassermann reaction or other stigmata of syphilis will corroborate such a diagnosis.

Tuberculosis of the Breast.—Nathan Raw (*British Medical Journal,* April 12, 1924), draws the following conclusions from a series of ten thousand cases: 1. Tuberculosis of the breast is always caused by the bovine bacillus. 2. It is never primary, but is the result of lymphatic extension from the glands of the neck or axilla (excepting in the rare cases of general miliary tuberculosis). 3. In common with all other forms of surgical tuberculosis caused by the bovine bacillus, it responds readily to treatment by a tubercle vaccine prepared from an attenuated culture of human tubercle bacilli. The treatment must, however, be continued for a long period until an active immunity is established.

Renal Tuberculosis.—R. A. McComb (*Canadian Practitioner,* April, 1924), gives these indications for nephrectomy: 1. Where one kidney is tuberculous, even with good function, and the other is not tuberculous and has a good function. 2. Where one kidney is much diseased causing a great deal of trouble with practically no function, and the other is slightly infected and doing all the work. Contraindications: 1, both kidneys tuberculous; 2, where the better kidney has a poor function; 3, active and advanced lesions elsewhere, especially in the lungs; 4, other constitutional conditions.

Severe Tuberculin Reactions, Scrofula, and Status Lymphaticus.—Charles McNeil (*British Journal of Children's Diseases,* October-December, 1923), concludes that in a small number of cases of tuberculous infection the tuberculin cutaneous reactions are unusually severe. In a majority of such cases of severe tuberculin reaction the type of lesion is that formerly described as scrofulous, and commonly includes a scrofulous or phlyctenular conjunctivitis. There is evidence that such cases of scrofula are associated with the condition known as status lymphaticus. The term scrofula should be retained as denoting those types of tuberculous infection which are associated with the morbid condition status lymphaticus, and which in consequence exhibit an intensified reaction to the tubercle bacillus and its poisons.

New Method of Treating Tuberculosis of the Upper Air Passages with Local Phototherapy.—Emil Wessely (*Wiener klinische Wochenschrift,* June 19, 1924) found that erythema is produced by irradiation with violet and ultraviolet light. With red light the extent of penetration is a few centimetres, but with ultraviolet light it is only the fractional part of a millimetre. Irradiation with the latter B rays are developed in the affected tissues, which exert a great chemical influence: they react upon tuberculous tissue just as destructively as sunlight. The best results are obtained with rays of one three hundred millionth of a wave length to one three hundred forty millionth of a wave length; this part of the spectrum is the best.

The aim of the treatment is to imitate sunlight and to apply the light to the tissues affected with a suitable apparatus. The simple arc light does not serve this purpose, but carbon impregnated with metal salts is very suitable and provides a light which closely simulates sunlight in the part of the spectrum mentioned. These carbons contain copper. The lamps used by the author have a quartz lens, as glass allows the penetration of only a small part of the short wave lengths. The amount of light that falls upon a certain area is greater than that emitted by the quartz lamp. This light gives only a local reaction and only irradiated ulcers heal. Forty-eight per cent. of the cases were affected favorably and twelve per cent. remained unaffected.

Efficacy of Direct Culture of Tubercle Bacilli from Infectious Material.—Ernst Löwenstein (*Wiener klinische Wochenschrift,* March 6, 1924), found that if five times the amount of a forty per cent. sulphuric acid or a thirty-five per cent. hydrochloric acid is added to a specimen of sputum, there is formed a voluminous sediment in which the tubercle bacilli may be found. With this technic all associated bacteria are destroyed and the tubercle bacilli may be cultivated on glycerin potato or egg albumin media in one hundred per cent of the cases. Organic acids, like acetic acid and lactic acid, do not destroy associated bacteria even in strengths of 50 per cent. Such a direct culture shows better results than the animal experiment. In some cases, in which the bacilli were not pathogenic for guineapigs, the bacilli were of the avian type. The latter have a marked affinity for the hemopoietic organs and occur with polycythemia and leucemia. The author was enabled to obtain a pure culture of the bacilli from sputum or wine even in cases in which the antiformin procedure failed to show a positive result.

PEDIATRICS

Wasting Disorders of Early Infancy.—Leonard G. Parsons (*Lancet,* May 10, 1924) draws the following conclusions: 1. That in many cases there is a great deal of evidence in support of the view that the onset of infantile atrophy is due primarily to the supply of insufficient and unsuitable food. 2. That however the initial loss of weight has been produced the continuance of the atrophic state depends upon an altered metabolism and not upon disorders of digestion and absorption. 3. That the rational treatment of pyloric stenosis of infants includes the performance of the Rammstedt operation at the earliest possible moment.

Acute Intussusception in Children.—W. A. Thompson (*British Medical Journal,* May 17, 1924) makes the following observations: 1. Eighty-eight per cent. of cases occurred in the first twelve months of life. 2. Sixty-two per cent. occurred between the fourth and the eighth month. 3. The ileocecal type only includes those cases where the intussusception apparently started at the ileocecal valve and where this remained as the apex. 4. The majority of cases started as ileocecal, in which the last portion to be reduced was the ileum. The commencement of the intussusception in the ileum was recognized as a well defined dimple. 5. The jejunal type of intussusception described in so many textbooks was not seen by the author. It is found postmortem in children dying from other diseases. It is probably of no pathological importance. 6. The ileocelic type was the most fatal. Perhaps this type may occur in those cases where the cecum is less mobile.

Mortality in the Surgical Diseases of Children.—George David Cutler (*Boston Medical and Surgical Journal* August 21, 1924) gives as the factors entering into mortality in these cases the nature of the disease or injury, its duration before surgical intervention, and the age of the patient. Analysis of the 261 mortalities in 8512 patients shows that about half the deaths resulted from infection, a quarter from congenital malformations. Delay is of importance, and the younger the patient the poorer the prognosis.

Mortality in the surgical diseases of children may be further reduced by prevention of infections, burns, trauma; earlier diagnosis of surgical conditions with immediate and appropriate treatment; attention to preoperative condition of the patient as regards dehydration, lack of blood, acidosis, improper feeding and correction of same.

Successful operations on children demand specially trained surgeons and attention to conservation of body heat, speed consistent with accuracy, careful hemostasis and gentle

manipulation of tissues. After operation supply heat, treat dehydration and acidosis as occasion arises. The use of breast milk is of great importance in feeding infants after operation. Transfusions, exsanguination transfusions and intravenous medication with mercurochrome or gentian violet offer some hope for reduction of mortality in severe infections. Dakin's solution irrigations are of great value in appropriate cases of localized sepsis. Intestinal drainage above obstructions perhaps with more two stage operations will lower the mortality from this condition. Only earlier recognition of tumors can contribute to a reduction in their operative mortality. It is doubtful if this will affect the end results. Postoperative treatment with xray or radium offers only a possible chance of cure. Spina bifida and hydrocephalus continue to be perplexing problems for the surgeon. The high mortality rate is only slightly reduced by surgical interference.

Hemorrhage of the Newborn.—Floyd Clarke (*Archives of Pediatrics,* May, 1924) summarizes his findings as follows: 1. Hemorrhage of the newborn is more frequent than the early literature would lead us to believe. 2. Blood coagulation and bleeding time tests should be done as a routine and thus possibly prevent some of the early deaths occurring in infancy. 3. More autopsies should be done and thereby assist in proving these facts and bringing them to more general notice. 4. Early surgical procedure and diagnosis may help in preventing some of these children from becoming hopelessly crippled and mentally deficient. 5. The injection of whole blood is curative in hemorrhagic disease of the newborn.

Malignant Tumors of Testicle in Children.—A. A. Kutzmann and T. E. Gibson (*Annals of Surgery,* December, 1923).

1. Malignant tumors of the testicle in children are comparatively rare.

2. These tumors are extremely malignant and of them, the teratoma, which is found mostly in early childhood, is the most malignant.

3. The prognosis of malignant tumors of the testicle in children is very grave.

4. The mortality rate is very high and has as yet been very little influenced by present methods of treatment.

5. The case reported is probably an embryonal carcinoma of the left testicle; that this tumor is highly malignant is evidenced by the local recurrence, the extensive metastases to the lungs, right lobe of the liver and retroperitoneal ymph nodes and by the invasion of the inferior vena cava.

Arsenic Dermatitis in a Child, Treated with Sodium Thiosulphate.—Charles R. Bugg and Caspar Folkoff (*Bulletin of the Johns Hopkins Hospital,* March, 1924) report a case of severe dermatitis in a child following the administration of arsenic. The patient received six injections at intervals of one week of 0.22 gm. sulpharsenol intramuscularly into the buttock. The patient manifested a marked eczematous and exfoliative type of dermatitis, which responded well to the intravenous injection of sodium thiosulphate. The drug was given in four graduated doses, a total of 1.35 gm. being sufficient to cause practically complete disappearance of the skin lesions in the course of six days.

Dyspepsia in Childhood.—C. E. Sundell (*Practitioner,* July, 1924) says: All are familiar with the child who "can't eat" this or that, or who "never eats a proper meal." What is required in many of these cases is treatment of the mother rather than of the child. Children live in a world of fancy, in which they are the centre and pivot, round which all their surroundings and experiences revolve; they have a constant desire to express their personality and to attract interest; what finer opportunity can they find for this than a tussle with authority at every recurring mealtime? The pleasure of eating is for these children negligible compared with the gratification of the sense of selfimportance by refusal to eat. The wise mother or nurse can appreciate this point of view, and by calm neglect of the point at issue can shatter the child's resistance. By the time we are consulted in these cases, coaxing, cajoling, threatening and punishment have all been tried, and too often the result has been complete failure. The best advice to give is that small portions of sound food should be provided; if these are refused no comment is to be made, but at the end of the mealtime the food is to be thrown away in the presence of the child. This plan is far more often successful than the alternative of serving up at a meal food discarded at a previous meal. In all cases it is essential that there should be no fuss, no apparent distress of mother or nurse, and, most important of all, no hint or mention of food refusal in the hearing of the child.

Fixed Principles in the Feeding of Infants.—F. M. Fry (*Canadian Medical Association Journal,* June, 1924) suggests the following general principles as suited for agreement. There is no one artificial food suitable to all infants (or all adults). Infants vary greatly in their idiosyncrasies, their toleration and digestion of food and even in their requirements. Patients, therefore, need to be studied and tested just as much as foods have been in the past, and a few days are well spent in testing a child's toleration. The food should be suited to the patient, not the patients to the food. Feeding must be, partly at least, empirical, for foods must be digestible and otherwise acceptable to each patient. Infants have a reserve, often, of digestion, which we cannot measure, and there may be several different but equally successful foods for a given case.

Human milk is still the best food for the human offspring, and therefore that artificial food, at least in normal cases, should be preferred which most resembles human milk. Caloric feeding, if rigidly followed, is often a farce, for a calorically correct food is by some infants refused, or vomited or discarded by the bowel, and children vary in their caloric requirements. The most accurate means of measuring quantities is by calories. Qualitative feeding (percentage feeding) alone is equally fallacious—both the qualitative balance and the caloric value should be considered.

It is wise to distinguish between feeding in the normal and feeding in the abnormal. In the former our rules will apply; in the latter our rules may fail us and empiricism must prevail. Proteid milk is a temporary therapeutic agent with a definite narrow indication. The chief value in proteid milk, in concentrated or in modified proteid milk, and in lactic acid milk, is in the lactic acid which inhibits all other bacterial activity and makes casein more digestible. It is not important (in most cases) to give any one sugar exclusively. Maltose is absorbed in larger proportion than other sugars, breaks up into two molecules of dextrose, and often quickly gives a striking gain in weight. It aggravates some cases of vomiting by being partly split up in the stomach, and is less laxative than other sugars, because it is absorbed higher up in the alimentary canal.

Critical Three Day Fever in Children (Exanthema Subitum).—This disease picture, previously described only by American authors, was also observed in Berne, Switzerland, by E. Glanzmann (*Schweizerische medizinische Wochenschrift,* June 26, 1924). It is characterized by a suddenly appearing and critically defervescing (after three days) high fever up to 40° to 45° C., followed simultaneously or after a few hours after the crisis by a scarlatinal or measles like rash, chiefly on the trunk and on the hairy parts of the head, which disappears after two days without any sequelæ. During the febrile stage the symptoms, in addition to unrest, anorexia, and headache, there may be no other or slight catarrhal symptoms. This disease affects chiefly infants at the age of six to twenty months. There seems to be no contagiousness. The striking and diagnostically and prognostically important features are the pronounced leucopenia with a marked relative lymphocytosis of eighty to ninety per cent., an increase of the large mononuclears and a diminished eosinophilia.

Effect of Fluid on the Temperature and Blood Concentration in the Newborn with Fever.—H. Hakwin, R. M. Morris and J. D. Southworth (*American Journal of Diseases of Children,* June, 1924) find that when fluid is given by mouth in the proportion of from thirty to forty c.c. to the kilogram of body weight a prompt fall in the temperature and blood concentration follows with great regularity. The temperature usually reaches normal within thirty to ninety minutes. When the fluid is given hypodermically or intraperitoneally, the effect on the temperature and blood concentration is neither so marked nor so regular as after water by mouth. Water by mouth, in amounts similar to those used in the newborn with fever, has practically no effect on the temperature of infants with fever due to various infections. In a group of older infants, dehydrated as a result of severe diarrhea, fluid by mouth is much more effective in reducing the concentration of the blood than fluid given hypodermically or intraperitoneally.

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Medicolegal Notes.

COLLISION WITH FURNITURE AS CAUSE OF MALIGNANT TUMOR

The Illinois Supreme Court, Ascher Bros. Amusement Enterprise v. Industrial Commission, 311 Ill., 258; 142 N. E., 488, affirmed an award for the death of a theatre usher from a malignant tumor alleged to have resulted from twice coming into collision with the end of a seat in the course of his duties. "His attending physician testified that in his opinion it was a traumatic sarcoma; that sarcoma is a malignant growth, a tumor which has a tendency to spread and an inherent tendency to destroy life; that in his opinion a person walking down a theatre aisle and bumping his knee against a seat would not ordinarily produce sarcoma, but it is very common, following even the slightest injuries. He testified that the death was primarily due to the sarcoma."

EXEMPTION OF CHARITABLE HOSPITALS FROM TAXATION

In a suit by the city of San Antonio and the San Antonio school district against the Santa Rosa Infirmary and the Sisters of Charity of the Incarnate Word for taxes, the sole defense was that the defendants were exempt under section 2, article 8, of the state Constitution and Revised Statutes, article 7507, exempting public charities from taxation. Reversing judgment for plaintiffs rendered by the Court of Appeals (249 S. W. 498) the Texas Commission of Appeals says that the constitutional requirement is twofold; the property must be owned by the organization claiming the exemption; it must be exclusively used by the organization, as distinguished from a partial use by it, and a partial use by others, whether the others pay rent or not. It was held the hospital was exclusively used by its owners as a general hospital, though the major part of the rooms were used for pay patients, although surgeons, not themselves wholly engaged in a charitable work, were permitted to use the operating rooms for certain fixed charges imposed upon their patients able to pay, although a certain ward was devoted to the charitable work of a clinic conducted by the Sisters of Charity, and although the dispensary in the building sold drugs to its pay patients for a profit. The state Constitution does not in terms require a charitable institution, if it may claim exemption from taxation, to use its buildings exclusively for charitable purposes, as it does require in the case of educational institutions that they be used exclusively for educational purposes, but the requirement is only that the buildings be used by the charitable institution as above pointed out. Both the clinic and the drug store were operated by the owners of the hospital.

Such a charitable institution, it is held, to be exempt from taxation, need not be founded exclusively upon gratuities or donations, and does not lose its exempt status because it goes in debt for its plant and pays that debt and the interest accruing on it out of its incidental earnings.—Santa Rosa Infirmary v. San Antonio (Tex.), 259 S. W. 926.

KANSAS COURT'S DEFINITION OF IMMEDIATE AND CONTINUOUS

In an action on an accident policy the evidence tended to show that the plaintiff, in going to the telephone in the night, injured his great toe by striking it against the furniture with such force as to drive the nail into the flesh, resulting in the nail having to be removed. For about ten days plaintiff was unable to conduct his business; for the next ten days he was able to perform his office work, when what proved to be a pyogenic infection developed, requiring him to go to the hospital, where he remained for some time and was operated on several times. The insurer contended that plaintiff was not continuously disabled longer than the first ten days after the accident; and that any loss of time after that was not covered by the policy. The policy had a rider indemnifying for injury by pyogenic infection resulting from an accident. The evidence was that the pyogenic germs, or pus creating germs, do not develop at once from the injury, but require time in the natural course of events for their development. An injury develops at once, it is held, within the meaning of a policy of this character, when it follows directly from the accidental hurt within such time as the processes of nature consume in bringing the person affected to a state of total incapacity to prosecute every kind of business pertaining to his occupation. Hence the fact that it took ten days or more for the injury to develop in its ordinary course to such an extent that plaintiff was wholly incapacitated from performing any of his duties did not prevent the injury from being immediate and continuous within the meaning of the policy. Rabin v. Central Business Men's Assn., Kansas Supreme Court, 226 Pac., 764.

ELECTION OF REMEDIES BY SETTLEMENT OF SUIT FOR MALPRACTICE

In an action against physicians for damages for breach of an agreement by which the defendants were alleged to have agreed for a consideration to cure the disease from which the plaintiff was suffering, the pleadings disclosed that for the alleged injuries received in the treatment the plaintiff had a right to proceed against the defendants either in an action in tort or an action ex contractu for the breach of an agreement, and that he had elected to sue the defendants in tort for malpractice, which suit was settled for $2,000. The Alabama Supreme Court, Knowles v. Dark & Boswell, 99 So. 312, holds that the same act constituted both a breach of the contract and a tort, and that the plaintiff's election of remedies by suing in tort and receiving compensation in that action precluded his recovery for breach of the contract.

COUNTY'S LIABILITY TO PHYSICIAN FOR PROFESSIONAL SERVICES TO POOR

The Kansas Supreme Court holds, Leinbach v. Board of Comrs. of Pottawatomie County, 226 Pac. 993, that an unintentional failure of a claimant to verify his account against the county for medical services performed at the instance of an overseer of the poor is not a justifiable ground for the rejection of the claim.

Assuming the truth of the facts alleged and admitted—that the plaintiff, a physician, at the instance of the township trustee as overseer of the poor of the township, rendered medical services to a moneyless and friendless person lying dangerously ill in a third class city in a certain civil township over which the township trustee had jurisdiction—it was held that the county was liable for the reasonable value of the professional services so rendered by the physician.

MEDICAL TESTIMONY AS TO EFFECT OF INJURY ON PLAINTIFF'S ABILITY TO FOLLOW OCCUPATION HELD ADMISSIBLE

In an action for personal injuries consisting of a fractured skull, the Oklahoma Supreme Court holds, Marland Refining Co. v. McClung, 226 Pac. 312, that it was not error to permit a medical witness who had examined the plaintiff to state his opinion as to whether the injury would interfere with the plaintiff in following his occupation, which involved manual labor.

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American Surgery and the Surgery of the World

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Those who wish to promote American surgery must know the nature of world surgery, and carefully appraise its rival activities and successes. To them must be sharply known the various countries and cities of the world where the problems pressing on us for solution are being most keenly studied. In their minds must rest knowledge of where are the present centres of practical clinical and research opportunities; of free, abundant and accurate publications; of the expansion of influence by contacts among students and teachers, and the very routes of commerce and travel that provide the advantage of interrelationship which vitalizes surgical enthusiasm and action.

One must distinguish between the insular and the cosmopolitan types of surgery. The latter are inclusive, general, productive, expansive; the former are contracted and barren—their successes are fitted for themselves alone, their failures are without even postmortem profit to anyone. In America one can make effort to keep in touch with and practise universal surgery; but it can be done only with great labor and a deep well springing of interest and enthusiasm.

There are four world divisions of surgery—the Teutonic, the Latin, the British and the American. The Scandinavians with their new and brilliant *Acta Scandinavica Chirurgica* are forging forward, under a heavy linguistic handicap, for a fifth division.

Each of these divisions is characterized by human temperamental and intellectual differences and by the possession of ethnical, linguistic, political and economic unities that invite or enforce common methods of action.

Let us glance for a moment at these world divisions of surgery. The Teutonic has the advantage of mass. The thoughtless often consider that crushed Germany, having no longer ample power to maintain her mechanism of universities and clinics, is not now much to be considered as a factor in surgery. This lapse of reasoning is a fatal error of generalship, for two great reasons. The first is that our German fellow scientists are full of activity and enthusiasm. Increased sickness due to national depression and the burden of the war-maimed have stirred the Teutonic profession to the heart. The German surgical congresses are strong and fairly well attended, although all continental surgeons find it difficult to obtain new books and periodicals, and research is greatly hampered. The second reason is that Germany has the intimate intellectual sympathy of all that part of Europe lying north, east and southeast of her. To this must be added the more or less intimate thought cooperation of Switzerland, of Italy, of Turkey and of Japan. The Scandinavian countries and Holland share the feeling of the other countries mentioned that surgical contributions of the first class ought to find at least secondary publication in the German language. These facts make it necessary for progressive surgeons to continue the study of German surgery even today. For Teutonic surgeons give the world now a larger, more varied, more piquant and substantial literature than does any other single group mentioned in our analysis.

The Latin division also has been stimulated by the war necessities and opportunities. Here France easily leads, and dominates the surgery of all the lands touching the Mediterranean Sea as well as all Latin America. If Paris were to gather, entertain and instruct the surgeons of all Romance language countries biennially her helpfulness and power would be infinitely greater. The Latin division of surgical literature needs more diligence, greater depth and thoughtfulness with a profounder basis of research. May material prosperity come to the aid of our French brethren.

British surgery, backed by the English speaking surgeons of all non-American countries is hopelessly John Bullish—God bless it. We have, all of us, the defects of our qualities. British surgeons of the highest ability sometimes give us epoch making contributions. But not enough British surgeons write; they have only one first class surgical journal; they do but little experimenting; they do not visit or sufficiently consider the vast jungle of the Continent of Europe, although they are beginning to notice America; and their books are usually *ipse dixit* affairs, disdaining the long, tedious, well chosen pages of literary references that are a joyous find for the man who writes the next article of the necessarily endless stream. It is typical of England that she discovered Lister abroad! British surgery grows and is helpful. We wish there was more of it.

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The American division of surgery is waking up. The glories of its nineteenth century activity consisted in some brilliant isolated McDowells, Thomases, Emmetts, Grosses and the like, some of whom, laudably enough, peddled their ideas in Europe to gain recognition and renown.

What has given us the American surgery of our day? It was the influence of men like the Dane, Fenger, the Swiss, Senn, the Canadian, Osler, and the American, Halstead, who brought Continental European modes of scientific thought into our midst and who taught our young men to go to Europe for more of such cultural contacts.

No country can remain scientifically isolated and thrive in surgical thought. Two bits of service of the first quality have been recently performed for American surgery—first and most important, the attraction into our periodical literature of first quality original articles by surgeons from world remote lands; the other the cultivation of scientific friendship with Latin American surgeons.

American surgery seriously needs deeper scholarship and critical acumen. The scholarship we need is the larger scholarship that would give surgery its just setting amidst world intellectual culture; the criticism demanded would gently and firmly put to the forefront dignified and scholarly speech and writing, eschewing vulgarity of thought and wording. It would edit away colloquialisms of speech from dignified reviews; it would restore the memories of our surgical forefathers even if they knew not of asepsis. Especially would it enforce the grammatical and even the graceful use of language, driving back to its lair the admissible brutalities of the protocol. We must welcome the advent of unhasting surgical reviews. And especially must we avoid the insular study and citation of the work of others as presented in the English language alone. We must be of all the work, not of America alone.

Furthermore, let no American surgeon practise his art to suit the fashion of American congresses or, indeed, of any other isolated bodies. Let our ambition, for each of us, be to know the surgery of the whole world and choose, each for himself, the very best. Let us have no standardized surgery; let us have a progressive surgery, individual, keen, discriminating, lofty and conservatively bold.

American surgery can be great only by consorting with the surgery of the whole world, choosing the best and adding thereto its own profoundest thought.

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Focal and General Infections*

Factors in the Production of the Acute Abdomen

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With the passing of typhoid fever and the occasional perforation of the bowel which accompanied it, the most frequently recognized acute surgical abdomen in the presence of a bacteriemia ceased to exist. It is interesting to note that probably the typhoid bacillus *per se* was not responsible for the perforation—at least cultures obtained from the peritoneal cavity and edges of the ulcer failed to show it, more frequently the colon bacillus and streptococcus were found.

The pneumococcus and the streptococcus invade the abdomen through the blood more frequently than any other microorganisms. In the pneumonias of children due to the pneumococcus, the peritoneum is attacked infrequently compared with the other serous cavities and is usually only seen by the surgeon when the patient is in extremis. This is also true of the peritonitis due to the streptococcus alone. The patient's chance for recovery is slight, as he is overwhelmed before the tissues are able to react. Dudgeon and Sargent (35) believe that the reason death takes place so rapidly in streptococcic peritonitis is due to the fact that the body cells are only slightly phagocytic.

The accepted treatment for these two conditions at the present time is primarily not surgical. To live, the patient must react vigorously. The best the surgeon can do is to recognize, institute Oschner treatment with the hope that the infection will localize. At times, however, a bacteriemia due to an attenuated type of pneumococcus, streptococcus or other microorganism occurs in which the secondary process localizes in the alimentary canal or its accessory organs. Whether this localization interferes with the normal functioning of the organ depends first upon the virulence and peculiar characteristics of the infecting organism, and secondly, upon the resistance of the patient. Likewise, its recognition will depend upon the organ affected, the relation it bears to the digestion and the extent of the pathology. If the lesion is small it may heal without leaving any evidence of previous involvement so far as symptoms and signs are concerned and frequently microscopic examination of sections of the supposedly diseased organ fails to show the pathology suspected. An example of this remarkable reparative process was recently observed by me: a perforation had occurred in the centre of an indurated ulcer, two cm. in diameter on the anterior wall of the first portion of the duodenum; the opening was closed by simple inversion; the patient recovered and returned two months later for excision of the ulcer; at operation no evidence of the former pathology could be seen or felt and a careful inspection of the mucous membrane of the duodenum failed to reveal any evidence of the former condition. A chronically diseased appendix probably accounted

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for the digestive symptoms which antedated the second operation.

The associated lesion in this case is not an uncommon finding at operation and at times accounts for the absence of pathology in tissue removed and explains, in many instances, the frequency with which symptoms and signs indicating a disease of one organ may be actually due to lesions in more than one or in the one least suspected. While these associated lesions found at operation are usually chronic in type, there is evidence that acute lesions occur concomitantly in the appendix, duodenum and stomach. The work done by Lansdonne and Williamson (23) is interesting in this respect. They found that in the substance of the mucous membrane of the intestinal tract are small round cell aggregates more or less distinct from the lymphoid follicles and that these appear "to suffer some general enlargement or destruction in appendicitis, gastric or duodenal ulcer and certain forms of dyspepsia." In a study of thirty-three patients dying as a consequence of septic appendicitis, the follicles in other parts of the gastrointestinal tract not infrequently showed equally definite evidence of attack. Microscopic ulceration and scarring of the gastric mucous membrane, ulcers at the base of the crypt's of Lieberkuhn, particularly in the jejunum and occasionally in the lower part of the large intestine and upper rectum occurred. These authors are of the opinion that the conditions mentioned originated as a result of some noxious agent, the nature of which has not been absolutely determined.

Studies made of diseased appendices from patients who came to operation for other conditions disclose the fact that a certain percentage are removed, in which the etiological factor is difficult to explain. Williamson and Slater (24) report the histological examination of five hundred appendices at the Boston City Hospital on the Gynecological Service. Of this number one hundred and sixty-seven were abnormal; sixty-four could be traced as secondary to pelvic inflammation, leaving one hundred and three abnormal appendices without signs and symptoms of disease. In other words, there were changes in the appendix without known cause and without apparent harm to the patient. No case diagnosed as appendicitis was admitted to the report.

It is within the realm of possibility that these lesions of the appendix, symptomless and without known cause, may have been but part of a general inflammatory process with local manifestations involving lymphoid tissue elsewhere. Murphy (34) has demonstrated the physiological relationship that exists between lymphoid tissue in the various parts of the body. I have seen lymph nodes in the axilla disappear as if by magic upon the application of radium to the cervical nodes in pseudoleucemia. Histologically we know that the younger the patient the more cellular is the lymphoid tissue. This is just as true of the tonsil as it is of the appendix and Lansdonne and Williamson (23) have shown that the lymphoid aggregates mentioned usually disappear from all situations after the age of forty.

The fact that in children appendicitis is rarely diagnosed as such, primarily, is not wholly due to the age of the patient, since the real condition is often obscured by a systemic reaction to infection that seems to be general in its scope and while it is not unusual to find septic appendicitis directly preceded by attacks of tonsillitis or exanthema in juveniles, in the adult it is rare. The following is a case report of an adult male, who developed appendicitis during the height of an attack of streptococcic tonsillitis:

Case.—Patient, male, aged thirty-seven, abdominal pain and sore throat developed thirty hours before admission to the hospital. Physical examination disclosed swollen tonsils covered with a grayish white membrane, and a rigid right lower abdomen. Temperature 103°, pulse 100, respirations 20. Leucocyte count 21,800; polymorphonuclears 85 per cent. A diagnosis of tonsillitis complicated with appendicitis was made. Operation under intraspinal anesthesia disclosed a perforated gangrenous appendix with general suppurative peritonitis. Culture from tonsils showed streptococci; from the appendix streptococci, coliform bacilli and diplococci. Blood culture negative. Patient discharged from the hospital on the sixteenth day.

Deaver (25) reports Kietz (26) as having seen two cases of appendicitis following tonsillitis. In one case streptococci were obtained from both the appendix and the tonsils, and in the other he recovered streptococci from the tonsils. In these instances the route of infection is usually by way of the blood stream. Dudgeon and Mitchner (27) made blood cultures from twenty-five patients suffering with acute appendicitis and found short chained nonhemolytic streptococcus in one case and a massive growth of a similar streptococcus was obtained from the interior of the appendix, which was gangrenous. Rosenow (28) believes that localization of the streptococci in the gastrointestinal tract is due to its peculiar qualities. He found that cultures of Streptococcus viridans obtained from patients suffering from severe gastrointestinal influenza produced lesions in guineapigs similar to those noted in patients.

Appendicitis accompanying or following an attack of influenza was not uncommon, especially during the worldwide epidemic. Potter (29) reports a case, Smith (30) reports another and Behrend (31) reports eight cases. He operated upon three of these patients and calls attention to the fact that the patients had been in bed four days before the symptoms of appendicitis developed. Whether it is due to the direct action of the infecting microorganism on the mucosa of the appendix, or to defective drainage on account of the swelling of the appendicular orifice is not known. In any instance the complication should be suspected in the average case of intestinal influenza in which the following symptoms and signs present themselves:

Persistent lower abdominal pain associated with tenesmus.
Localized tenderness.
Dullness in the flanks.
Increasing leucocytosis.

The symptoms of the true gastrointestinal type of influenza are, according to Rosenow, due in part to an anaphylactoid reaction which accounts for the difficulty in diagnosing the intraabdominal complications. Diarrhea is usually not an accompaniment of appendicitis and this in itself is misleading, espe-

cially if assocated with rectal tenesmus. In addition, the albuminuria of acute nephritis, which is not infrequently associated, may lead one to believe that the leucocytosis is due to a pyelonephritis. One should rely for the most part on the presence of localized tenderness, but even here the reaction of the peritoneum to stimuli seems to be diminished, the abdomen at no time presenting a semblance of rigidity commensurate with the degree of peritoneal involvement. A vaginal or rectal examination is helpful in arriving at a correct diagnosis. We recommend the use of spinal anesthesia in the acute abdomen in the presence of respiratory or nephritic complications.

Case II.—C. S., male, aged fifteen. Myalgia, cephelalgia and pharyngitis developed three days before admission to hospital. Diarrhea and tenesmus became marked; on second and third days patient said he had a hundred bowel movements. No nausea or vomiting. On admission, abdomen was slightly distended, no rigidity, slight tenderness in right lower quadrant, percussion tenderness over both kidneys. Urine showed heavy cloud of albumin, many red blood cells, leucocytes, granular casts and bacteria. Leucocyte count 11,000, polymorphonuclears 78 per cent. Operation under intraspinal anesthesia. Appendix nine cm. in length. Perforated two cm. from tip; distal three cm. gangrenous. On the twelfth day following operation, a subphrenic abscess was opened and drained; on the thirty-sixth day, abdominal wounds were closed following sterilization. Discharged from hospital on the forty-eighth day.

PERFORATED DUODENAL ULCER

In 1912 I reviewed the case histories and visited personally twenty-eight patients who had been operated upon for perforation of the duodenum by Dr. Babcock and his associates prior to that date. Since that time about twenty patients have been operated upon for the same condition. With one exception, the perforations occurred in males, who were, in ninety per cent. of the cases, suffering from gingivitis, pyorrhea and dental defects of marked degree. It was my opinion at that time and I still believe that focal oral infection is responsible for the majority of these perforations. It is true that in most instances cultures taken from the site of perforation fail to show organisms, but one must remember that the acid gastric juice may interfere with the growth. It has been repeatedly demonstrated that cultures taken from the edge of the ulcer show a greater percentage of positive findings than those from the peritoneal exudate. Wilensky (36) believes "that the perforation through the base of an old ulcer is an embolic phenomenon occurring during the course of some temporary bacteriemia, the evidence of which may be so transitory as to be undemonstrable."

Mutch (33), in a bacterial study of the intestinal content of those suffering from infections of the teeth, gums, tonsils, nose and pharynx, is of the opinion that from the centres of saprophytic growth in the chyme of the ileocecal region long chained cocci invaded the mucous membrane and so opened up new channels for their dissemination in the tissue, where they continued life as parasites. They frequently spread upward, invading the jejunum and sometimes the duodenum. Dudgeon and Sargent isolated streptodiplococci from the edge of perforated gastric ulcers in every case and from the peritoneal exudate in four instances out of a total of seven. It appeared as a diplococcus and also in chains of eight or ten cocci or diplococci. It was gram negative and a twenty-four hours' broth culture injected intraperitoneally failed to kill guinea-pigs.

In perforated duodenal ulcer the bacteriology is somewhat different. In most instances the exudate is sterile but the edges of the ulcer may contain staphylococcus, occasionally the streptodiplococcus or the colon bacillus.

ETIOLOGY OF ACUTE PANCREATITIS

From the standpoint of etiology, diagnosis and treatment, the relationship that diseases of the gallbladder and ducts bear to acute pancreatitis is of the utmost importance.

When Fitz (1), in 1889, published his paper on acute pancreatitis, he did not appreciate apparently that there is any pathological relationship between infections of the biliary tract and the pancreas. He calls attention to the rarity with which jaundice is associated with the disease, but no mention is made of biliary disease having been found at operation or post mortem in the sixteen cases he reported.

In 1901, when Opie (2) reported a case of acute hemorrhagic pancreatitis in which a small gallstone had lodged at the orifice of the diverticulum of Vater, so that it had converted the common bile duct and the duct of Wirsung into a continuous closed channel allowing neither bile nor pancreatic juice to escape, an interest in the relationship between the two conditions was stimulated. In 1903, he collected nine cases of acute hemorrhagic pancreatitis in each of which a calculus had been lodged near the termination of the bile duct.

Von Mikulicz (3), in 1903, thought that acute and chronic pancreatitis often followed cholelithiasis and cholangitis. Robson and Moynihan (4), in 1903, were of the opinion that "the essential and immediate cause of the various forms of pancreatitis is bacterial infection." In their opinion gallstones need not be present to produce the lesion. Mayo, Robson and Cammidge (5) quote Williams, Busch and Egdahl, who found that gallstones were present in forty per cent. of the cases of acute pancreatitis. Musser (6) in 1909 reported nine cases of acute pancreatitis with a history of gallbladder disease in seven.

In 1910, Opie (2) states that "no relation between hemorrhagic necrosis of the pancreas and bacterial invasion from the intestine has been demonstrated."

Korte (7) in 1912 reported forty-four cases of acute pancreatitis: twenty-one had cholelithiasis and one an infectious cholecystitis. J. E. Sweet (10), 1915, believes that the etiological factor in acute pancreatitis is the activation of the trypsinogen into trypsin, and that the liberation of the trypsin takes place by infection or trauma; infection taking place by way of the lymphatics.

Deaver and his coworkers, while being in accord with Sweet, differ somewhat in their opinion regarding the exciting cause. Deaver and Pfeiffer

(8), Deaver (12), Deaver and Sweet (15), believe infection takes place through the lymph channels; on the other hand, Deaver and Ashhurst (16) and Deaver and Remian (18) are of the opinion that the retrojection of bile as described by Archibald is a reasonable theory.

Moynihan (9), 1915, states that "the onset of the acute inflammation is due, in many cases, to the blocking of the ampulla of Vater by a small stone." Judd (11), 1916, agrees with Sweet. Archibald (14), 1919, believes that necrosis of the pancreas is the direct result of the action of substances entering the duct of Wirsung. D. F. Jones (19), 1920, reports forty-two cases. He believes the inflammation is due to retrojection of bile into the duct of Wirsung or duodenal contents into the duct of Santorini.

Undoubtedly the essential factor in acute pancreatitis is the activation of trypsinogen into trypsin. Whether the captivating agent is chemical and reaches the pancreas through the ducts of Wirsung or Santorini or whether it is an infection and passes by way of the lymphatics has not been absolutely determined. It is highly probable that both occur. From a review of the case histories, we can safely state that fifty per cent. of the cases had cholelithiasis. The exact percentage of patients who had cholecystitis will never be known. If we are to accept Judd's statement (20) that "we (the Mayos) were unable to recognize all cases of cholelithiasis with the abdomen opened," or Willy Meyer (21), "a glistening, bluish, soft and nonadherent gallbladder found during operation may be diseased and harbor pathological organisms within its walls," we can appreciate that many gallbladders have been reported normal in connection with acute pancreatitis that must have been diseased. Graham and Peterman (22) believe that in the majority of cases a cholelithiasis is produced secondary to a hepatitis by lymphatic extension. "By the direct injection of organisms (streptococci or staphylococci) into a radicle of the portal vein, as for example, the appendix vein, it is possible to produce cholecystitis almost as a routine." Might not the latter observation explain those cases of hemorrhagic necrosis without apparent etiology?

DIAGNOSIS OF PANCREATITIS

If one half of the patients in whom acute pancreatitis develop have gallstones and a fair percentage of the remaining half have hepatitis, choledochitis, or cholecystitis, a careful history will, in the majority of instances, lead one to suspect the previous involvement of the biliary system. Too much stress can not be laid upon the importance of a careful clinical history. In my opinion this is much more important from the viewpoint of diagnosis of uncomplicated biliary infection than physical examination, x ray findings, examination of the contents of the stomach, or even that obtained from the duodenum or biliary apparatus. Undoubtedly in a great many cases it will be impossible for us to determine by any means at our disposal at the present time that this infection is present in its incipiency, but a time will come when we will be able to accomplish this. Are not the complaints referable to the gastrointestinal tract which the patient brings to us and which we are wont to call qualitative dyspepsia due in part to a hepatitis which precedes or accompanies cholecystitis or pancreatitis?

The attack of acute pancreatitis is frequently ushered in with symptoms and signs not more severe than those which accompany the typical attack of gallstone colic. No doubt the pancreas is involved in a fair percentage of patients who have severe attacks of gallstone colic. Experimentally we know that the pancreas can take care of a considerable degree of necrosis. Bower and Clark (37), fifty mg. of radium screened with one mm. of brass were placed against the pancreas for twenty-four hours. Eleven days later a partial pancreatectomy was done. The dog died in an emaciated condition December, 1922, almost eight months after insertion of radium. At autopsy no remnants of pancreas were found.

The severity of the initial signs and symptoms of involvement of the pancreas *per se* depends upon the degree of the initial involvement. If the changes in the structure of the gland have produced an effusion with marked increase of pressure so that the capsule becomes tense, the pain becomes unbearable, the usual dose of morphia having no effect whatever; the location and type of pain differ from that of the average gallstone case in that it is more marked toward the midline and more constant; occasionally the pain may radiate to the right scapula or left loin. Associated with the pain is a marked shock; frequently this is so severe that the patient is rendered unconscious; more frequently semiconscious; the pulse becoming rapid and weak; the temperature subnormal; the lips and nose cyanotic; be a conspicuous symptom. It is usually accompanied by severe retching, the ejected fluid consisting of the contents of the stomach and then a bile stained mucus, at times containing blood. Physical examination of the abdomen shows it to be moderately distended, breathing being for the most part thoracic, a moderate amount of free fluid is usually present in the flanks and liver dulness is diminished. The upper abdomen shows an increased tension, more marked on the right and toward the mid line. Occasionally the entire epigastrium may be tense. Usually marked rigidity is not present. Perpendicular percussion on deep inspiration over a tense gallbladder elicits pain which is pathognomonic. Jaundice is rarely present.

DIFFERENTIAL DIAGNOSIS

Perforated duodenal ulcer.—The adult male between twenty-five and forty-five years of age, usually with a history of having indulged freely in alcohol, with previous symptoms of pylorospasm or hunger pain and food ease, who is suddenly seized with epigastric pain, severe enough to double him up; who does not usually vomit unless he takes something by mouth; who has a subnormal temperature and is in a peculiar type of shock in which the pulse is of fair volume and usually not over eighty-eight or ninety; who, on physical examination shows a rigid abdomen with a right rectus which stands out prominently; a diminution of liver dulness which gradually increases and perhaps shifting dulness in the abdomen, presents a typical case of perforation of the duodenum.

Biliary colic.—The diagnosis in the average case is usually made from the clinical history; when com-

plicated with empyema, hydrops, or stone in the ducts, the diagnosis with the aid of a physical examination becomes easier because the gallbladder enlargement can usually be determined in the former conditions, even in the obese. The biliary colic is associated with certain types of cholecystitis is more difficult to recognize but can usually be made by excluding pylorospasm caused by duodenal or gastric ulcer or chronic appendicitis.

Acute appendicitis.—An inflammation of this organ sufficient to produce an acute abdomen that resembles acute pancreatitis is not common; however, patients are brought to the hospital with this diagnosis. They are usually younger, (although Dr. Babcock has had a case of pancreatitis in a girl of fourteen years). The onset is not as sudden; it is not associated with shock; the pain is less severe; vomiting is not so persistent and not accompanied by severe retching; the temperature is higher; perpendicular percussion point tenderness is present; rectal and vaginal examinations invariably clinch the diagnosis.

Renal colic.—In one of the cases reported this diagnosis was made by the attending physcian. The pain, while being primarily in the upper right abdomen, was referred to the right lumbar region. The peculiar shock associated with pancreatitis is practically never seen in kidney colic. The vomiting is less persistent. Lumbar percussion tenderness is present and microscopic examination of the urine is usually sufficient to make a correct diagnosis.

Acute dilatation of the stomach.—Usually this occurs during or after operation. I, however, have seen one case following a stenosed pylorus due to the swallowing of a bichloride tablet. Usually the pain is not as severe, while shock and upper abdominal distention are more pronounced. Vomiting is not associated with the severe retching and the vomitus is more frequently composed of altered blood. The passage of a stomach tube makes the diagnosis evident.

Intestinal obstruction.—Except in some cases of intussusception, intestinal obstruction is not accompanied with the acute, severe symptoms that characterize acute pancreatitis. The pain and shock are less severe, the vomiting is of the overflow and not the retching type; the distention is usually not upper abdominal; early tenderness is not marked; visible peristalsis can frequently be seen, obstipation and subnormal temperature are invariably present.

TREATMENT OF ACUTE PANCREATITIS

Operative interference for relief of pressure, a decompression, as it were, of the compressed pancreas, is immediately indicated and just as early relief of pressure of the compressed brain in certain types of cranial injuries is essential to recovery, so it is with the pancreas. The analogy is quite obvious; both are enclosed in close fitting capsules; both have the power to absorb a large percentage of their own weight of fluid, which, up to a certain point, is a protective mechanism. Recent investigations seem to prove that the poisonous products are in the early stages confined to the capsule of the pancreas (the fluid that is thrown into the peritoneal cavity is not toxic as proved by the experiments of Whipple and Goodpasture (32). See Bower and Clark (37).

If Nature's protective mechanism neutralizes the toxic ferments thrown into the peritoneal cavity, it would seem that during certain stages of the disease, harmful effects would result from an incision into the capsule or into the glandular structure, permitting the escape of poisonous products which might overwhelm the patient. Probably this stage is that of acute hemorrhagic inflammation; in the later stages, those of gangrene and suppuration, we see the end products of the action of the pancreatic ferments on pancreatic tissue, and this, logically, requires different treatment.

This seems to be borne out by investigating the different series of cases reported by various authors. In Korte's series of forty-four cases, there are thirty-four operations: twenty-two, or nearly sixty-five per cent., were operated upon after seven days had elapsed; twelve during the first seven days. He states that necrosis may occur as early as the third or fourth day, so practically all his cases were in the stage of gangrene or suppuration when treated and incision with multiple puncture of the gland as advised and practised by him would be indicated.

Referring again to the cases collected by Robson and Moynihan in 1903, we find that similar treatment was employed in sixteen of the twenty-eight cases reported, with one recovery. The gallbladder was not touched in any of the operations. The average time from the onset of symptoms to operations was eight days; the shortest, one; the longest, thirty days. One patient recovered thirty days after operation.

In contrast to the above, is the series of operations reported by Deaver, seventeen in all, in which cholecystostomy was done on eleven cases with three deaths. He does not give the average time between the onset of symptoms and operation in this series but it seems to prove that cholecystostomy does cure acute pancreatitis and it must do it by relieving tension on the pancreas. The operation not only relieves tension by lessening the intraductal and therefore intraglandular pressure but also provides for the escape of infectious or obnoxious substances through the lymph channels. (Sweet (38)).

Thus we see that there is a tendency to do less to the pancreas. Deaver states, "We do not practise free and indiscriminate incision into the swollen pancreas because of the difficulty of controlling the free hemorrhage that is likely to result."

Jones advises drainage of the fatty capsule and the pancreas itself, in addition if the condition of the patient will permit, either the sphincter of Oddi may be cut, a choledocostomy or cholecystostomy done. Archibald advises cholecystostomy with prolonged drainage, from three to twelve weeks. He advises against drainage of the pancreas by incisions through its capsule, believing that one cannot drain a diffuse necrosis.

Four cases of acute hemorrhagic pancreatitis have come under my observation at the Samaritan Hospital, Philadelphia, all of which had gallstone disease and all recovered from a simple cholecystostomy. Two of these cases came under my care. The following is a brief abstract:

Case III.—Mrs. M. C. (referred by Dr. L. O. Davis), aged forty-two, entered the Samaritan Hospital with a history of having had frequent attacks

of indigestion during the past year. Present illness began eighteen hours before admission to the hospital, with excruciating pain in right hypochondriac and lumbar regions. This increased in severity and she stated that she fainted six hours later, being unconscious for ten minutes. Shortly after, she had a chill; nausea and vomiting were marked. Pain twelve hours later became localized to upper right quadrant. Her family physician gave her a quarter grain of morphine hypodermically, this gave relief for a short time only, a second being necessary. Vomiting continued until admission.

The physical examination was negative except for abdomen which was scaphoid; generally rigid right upper most marked. Free fluid could be elicited in the flanks; liver dullness diminished; pulse 120; respiration 36; temperature subnormal; urine showed trace of albumen.

The preoperative diagnosis was acute pancreatitis. Operation under spinal anesthesia; vertical right rectus incision. There was about 600 c.c. of dirty bile stained fluid in the peritoneal cavity. The upper origin of the mesentery was infiltrated with a hemorrhagic exudate. The head of the pancreas was tense and hard. The gallbladder was one and one half times its normal size, distended and contained several small calculi; one at the junction of the cystic and common duct. A cholecystostomy was done, using a dressed tube; a cigarette drain was placed below the gallbladder. This was removed on the fourth day and the dressed tube on the fourteenth day following operation; the sinus closed on the twenty-second day. Two years after operation the patient was in excellent health.

CASE IV.—H. D., male, aged forty-nine, policeman (referred by Dr. A. D. Kurtz). Was admitted to the hospital with a diagnosis of an acute abdomen; seven years previously he had an attack of upper abdominal pain; following this qualitative dyspepsia developed. Eighteen hours before admission severe epigastric pain developed. He took a laxative without relief. There was no vomiting. Twelve hours later pain became intolerable and he became semiconscious. He called the family physician, who gave him a hypodermic injection of one quarter gr. morphine without relief. The physical examination was negative except for the abdomen, which was moderately distended; the upper right quadrant tense and tender; percussion tenderness marked over the gallbladder. The preoperative diagnosis was gallstone disease. Operation under spinal anesthesia; modified Bevan incision; peritoneal cavity contained about 500 c.c. dirty fluid, areas of fat necrosis studded the gastrocolic omentum, while the mesentery at its origin, the peritoneum covering the second and third portions of the duodenum and parts of the gastrohepatic and transverse mesocolon were the seat of hemorrhagic infiltration. The head and neck of the pancreas were swollen and likewise infiltrated. The gallbladder was twice its normal size, grayish in color, nonadherent, and contained 556 gallstones, from three to six mm. in diameter. The bile was greenish black in color and ropy in consistency. A cholecystostomy, using a dressed tube, was done; a large cigarette drain was placed over the head of the pancreas. This was removed on the fourth day; dressed tube on twelfth, and patient was discharged from the hospital on the sixteenth day. Later there developed an incisional hernia and the patient was operated on at another hospital. The gallbladder and pancreas were of normal appearance.

CONCLUSIONS

1. The acute surgical abdomen is at times a concomitant of general and focal infection.

2. Tonsillitis, influenza and oral infections frequently precede or are associated with acute appendiceal and duodenal lesions.

3. Advanced, moderate or incipient pathology of the biliary systems precede the acute pancreatic lesion, so that a careful history will usually elicit symptoms suggesting a focal infection in the biliary passages.

4. Acute hemorrhagic pancreatitis should be thought of as a possibility in the acute upper abdomen. The management of the case depends entirely on the stage in which the patient is seen. In the acute hemorrhagic stage in which a few hours have elapsed between onset of symptoms and operations, a simple cholecystostomy is sufficient to relieve pressure and effect a cure. When the disease has progressed to the stage of gangrene and suppuration, opening of the capsule and drainage of the pancreas, with cholecystostomy are indicated.

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A Familial Myopathy

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Interesting controversy marks the study of muscular atrophies. A search for definite morphological changes as the basis of their pathology has not been rewarded by completely clarifying the nomenclature of the myopathies.

Muscular atrophy is meant to designate a wasting of the muscles in which there are found pathological changes in the nervous system as the cause of the atrophy. By muscular dystrophy is meant a type of wasting with no discoverable lesion of the spinal cord.

The first observation on muscular atrophy was recorded in 1709 by Van Swieten. Later, Charles Bell described progressive muscular atrophy and in 1850 Aran and Duchenne placed this as a nosological entity. Duchenne believed this to be a disease primarily of the muscles. Cruvelhier, soon after, studied cord sections and stated the cause of the disease lay in the spinal cord. After much investigation with an improved histological technic, Charcot concurred in Cruvelhier's findings. He declared that the large multipolar ganglion cells of the anterior horns were the trophic centres of voluntary muscles and that pathological changes were present in muscular atrophy. Duchenne and also Erb accepted Charcot's interpretation. Friedrich, however, opposed their view and set forth that in a constitutional diathesis, weakening the muscular system's resistance, extreme exertions produce atrophy. He chose to call the condition polymyositis chronica progressiva and charged that Charcot's findings in the anterior horn cells were secondary to muscle deterioration.

Erb, in 1882, after personal study of numerous cases, declared that there were two distinct types of progressive muscular atrophy—a spinal atrophic form and a muscular dystrophic form, differing greatly in localization, syndrome and evolution.

In spite of Charcot's preeminence as a neurologist, he and his followers assented to Erb's differentiation. "In the course of time, all observers, Charcot and Marie included, agreed to accept the classification of Erb's" (1).

1. Dystrophia muscularis progressiva infantum
   - A. Hypertrophic form
     1. With pseudohypertrophy
     2. With true hypertrophy
   - B. Atrophic form
     1. With primary facial involvement (Duchenne's infantile form)
     2. Without facial involvement (simple atrophic form)
2. Dystrophia muscularis progressiva juvenum et adultorum (juvenile form).

Timmie (1) reports a family in which in several generations there is exhibited at times one of these groups and at other times another group. He states this is quite characteristic in the familial hereditary forms.

Recently, Leri, Girot and Basch (2) in a systematic study of seven cases of muscular dystrophy, "known also as idiopathic muscular atrophy," suggest that the line between muscular dystrophy and the spinal muscular atrophies should not be drawn too closely. They point out that muscular dystrophy is not strictly confined to the muscular system as there are frequently bony changes such as deformities of the skull and thorax, kyphoscoliosis and fragilitas ossium. Fibrillary twitchings and reactions of degeneration have been observed. In dystrophy, loss of tendon reflexes with preservation of muscles concerned has been noted. In such cases a nervous lesion must exist. However, in explanation of a Babinski toe reflex, Sicard (3) expressed the opinion that it is not necessarily a central nervous lesion as it may be due to relative weakness of the flexors, making extensor response easier when the foot is irritated.

In 1909 I observed a rather unusual type of body deformity, which, upon investigation, proved to be a familial myopathy. A search of medical literature failed to supply a description of this particular type. These cases now have been studied clinically over a period of fourteen years. Cord or muscle sections for morbid histology have not been available. In view of the fact, however, that certain prophylactic measures may save these patients extensive wasting, it would seem that this report is not premature.

DEFINITION

Familial myopathy is a hereditary, selflimited muscular dystrophy, appearing generally about puberty, affecting the muscles of the shoulders and arms, augmented by fatigue, toxemias and pregnancy; characterized by slow muscle wasting, producing a distinctive deformity and limited, awkward movements. It does not extend to other parts of the body nor decrease longevity. I believe this to be a disease *sui generis*.

ETIOLOGY

(Geographical distribution). The disease was first discovered in the wife of a pioneer who had left North Carolina in 1849. These people settled in the Mountain States but the family is now distributed in Utah, Idaho, Montana, California, Nevada, Washington and Oregon. It has been impossible to ascertain if the disease exists in other members of the family in the South.

Sex seems to play no important rôle. Of sixty-four per cent. afflicted, there were sixty-five per cent. of the males and sixty-three per cent. of the females affected.

These children are sound at birth and in childhood. About puberty there begins to appear so-called angel wing scapulæ. It develops at a later age in the male than in the female, in about the ratio that the female matures earlier than the male. This would seem to favor the contention of Timmie (1), that muscle atrophy is an endocrine disease, there being a change in the endocrine glands at this time of life.

Two children under observation for twelve years began to show the disease slightly at the ages of six and eight years. Even then there was little change until puberty and at that time of life the

ondition became pronounced. The father of these hildren, however, is a paretic and the mother is fflicted with the deformity.

Occupation had a decided effect on these victims. f the work is one that produces fatigue or excesive exercise of the muscles of the shoulders and

Fig. 1.—Note "finned" scapula, advanced position of heads of huneri, bare sternoclavicular junction and small right arm from use of violin bow, and hollow chest.

rms, the atrophy is greatly increased over a labor n which these muscles are allowed to rest.

The first case under observation, in 1909, was hat of a young man at the age of sixteen years. His nxious mother had watched his shoulders from irth, and now noticed the appearance of the winged capulæ. She was desirous that he be spared this ffliction, thinking, naturally, that if he chose a abor that would exercise the muscles of the shoulers and arms, these muscles would be enlarged and trengthened by such work. He studied violin and ecame an accomplished violinist—at the sacrifice of is shoulders and right arm. His right arm, with which he uses the bow, has now become so atrophic hat he is in danger of having to give up his profession. (Fig. 1.)

Occupation affects these cases in proportion to he overwork and fatigue breaking down the muscles, nstead of the normal enlargement under the stimuus of necessity.

In three cases where the disease had passed into a quiescent stage, the patients became the victims of nfectious diseases. Within three months after an ttack of typhoid fever, the deformity of one young nan was much increased. Another man, age twentyix, was able to do ordinary farm labor until he uffered from an attack of influenza in 1918. Since hat time he has been compelled to give up his work nd run a little candy shop, owing to increased weakess in the arms and shoulders. In a female patient Fig. 7) there developed marked atrophy of the latisimus dorsi following influenza. Her deformity was he usual one until this was added.

From these observations it would seem that toxnes of infectious diseases increase muscle wasting where the disease appears to be quiescent, either by action upon the anterior horn cells or directly upon the muscle fibres.

It is known to this family that pregnancy will bring on or increase the severity of deformity. From personal observation, one new case has developed and one woman made worse by pregnancy.

The deposit of adipose tissue tends to pad the shoulders and arms, and while it does not restore any of the reduced functions, the deformity is less apparent, with the exception of the advanced position of the heads of the humeri. The patient in Fig. 7 a few years ago, showed marked winged scapulæ and typical shoulder wasting but an increase in weight has served to improve her appearance.

The disease is decidedly an hereditary one. It is transmitted to about sixty-four per cent. of the children who reach maturity of those who are themselves afflicted. Members of the family who escape the disease do not transmit it.

Dr. C. H. Danforth, professor of anatomy, Stanford University, a research student of heredity, supplies the following discussion on heredity as an etiological factor:

The theory of heredity which has received the most general support assumes that the characteristics of the individual are primarily determined by discrete morphological entities in the germplasm. These are called genes. The individual is the product of interactions between these genes, and between them and environmental factors. The genes reproduce themselves with each cell division and are thus distributed to the tissues of all parts of the body. In development and in adult function it is the gene complex of the constituent cells which primarily determines the normal reactions of the tissues. With reproduction the maturation divisions result in germ cells with half the somatic number of genes. The genes, like the chromosomes in which they lie, are segregated in an orderly manner so that in the mature egg or sperm each gene is different from every other. At fertilization homologous genes are brought together in pairs and distributed essentially

Fig. 2.—Same patient as Fig. 1.

Fig. 3.—Lordosis posture.

in duplicate to the cells of the developing embryo. Within the same race the members of each pair are for the most part alike, but occasionally the homologous genes are not strictly identical. The result of such a condition may be a blend between the tendencies of the two opposing genes with a result-

FIG. 4. — "Finned" scapula. Same patient as Fig. 3.

FIG. 5.—Daughter of patient in Fig. 4, one year after puberty; normal before.

ing condition intermediate between those of the two parents, or one gene may act as a dominant entirely suppressing the normal effect of its mate. When such a dominant gene tends to produce some anomalous condition of structure or function this condition will appear in the individual who receives the gene from either of his parents and, on the average, in half of his children—since in reduction division half of his germ cells will get this gene and half will get its normal mate. Consequently the theory demands that when a single dominant trait is involved the typical family history will show that the defect appears in about half the children of each affected parent but in none of the children of normal members of the family.

E. G.: Suppose A B C D . . . . represent the individual genes and suppose a modification of A, call it A′, produces muscular atrophy. Then an individual with the disease will have the formula: A A′ B B C C D D . . . . When the cells divide in growth each of these genes will divide so that each of the two new cells will have the original formula; but in the formation of germ cells the well known reduction division process will separate the genes into two classes thus:

— AA′ —	Synopsis	— A)	(A′ —	
— BB —	and	— B)	(B —	
— CC —	metathose	— C)	(C —	Final
— DD —	stages	— D)	(D —	division
— ′ ′				
— ′ ′				

So the formula for the two kinds of germ cells will be A B C D . . . . and A′ B C D . . . . In other words, they are alike except for the one point, whether they contain A or A′. The chances that any given egg or sperm cell will contain A or A′ are even. Now if the affected individual marries a normal husband or wife all of the latter's germ cells will contain A B C D, etc., but no A′. Consequently when fertilization occurs there is an even chance that the germ cells involved will be A B C D . . . . A B C D . . . . or they will be A′ B C D . . . . + A′ B C D. This means that on the average half the children will be A A B B C C D D E E and half A A′ B B C C D D E E . . . . The former obviously should be unable to transmit the trait, the latter, identical with the affected parent, should do so.[1]

In the study of twenty families, extending over five generations, there was a total of 128 children. Of these 128 children whose parents were affected, in eighty-two the disease developed—sixty-four per cent. There were forty-nine males and seventy-nine females in all. Of the forty-nine males, thirty-two were affected, or sixty-five plus per cent., and of the seventy-nine females there were fifty affected, or sixty-three plus per cent.

These figures do not cover children under puberty or those who died before attaining that period.

[1]Original contribution.

PATHOLOGY

In the study of this disease no cases have come to autopsy. Also, it has been impossible to secure section of muscle from living subjects. It is natural to suppose there are degenerative changes in the anterior horn cells. Just whether this would be primary, producing atrophic disturbances in the muscles, or secondary to peripheral disease, is an unsettled question to the writer.

FIG. 7.—Daughter of patient in Fig. 6.

FIG. 6.—Atrophy extended to upper arm.

Wassermann reactions were negative in nineteen cases examined. It is not a luetic affliction.

X ray in nine cases failed to give any information. Study of the head in region of the base, clinoid processes and sella turcica revealed nothing. The value of pineal shadow is doubted. The scapulæ and heads of humeri show no trophic changes.

Work on blood chemistry, urine and basal metabolism is under way. As the patients are scattered and chiefly in rural districts this technical work is necessarily very slow. Absence of constant findings at present warrant no report.

The muscles usually involved are:

Muscle	*Nerve*	*Cord*
Rhomboidei	Posterior scapulæ	5 Cervical
Trapezius	Spinal assessory Cervical plexus	Sp. Cord and 3 & 4 Cervical
Teres minor	Circumflex	5 & 6 Cervical
Teres major	Lower subscapular	5 & 6 Cervical
Supra scapular and Infra spinatous	Suprascapular	5 & 6 Cervical
Deltoid	Circumflex	5 & 6 Cervical

and occasionally, though to a less marked degree of intensity, the

Muscle	*Nerve*	*Cord*
Triceps	Musculo spiral	5, 6, 7 & 8 Cervical
Biceps	Musculo cutaneous	5 & 6 Cervical
Brachialis anticus	Musculo cutaneous Musculo spiral	5 & 6 Cervical 5 & 6 Cervical

Timme (1) believes there is a definite relationship between the pineal gland and progressive muscular atrophy. Other recent investigators (4) support the theory of a disturbance of the endocrine glands in widespread muscular disturbances.

In as much as the disease generally appears first about puberty, a time of life in which there is a decided change of endocrine secretions, an endocrine imbalance may be rightly suspected as playing an important role in this symptom complex.

SYMPTOMS

The first indications to appear in the child of one afflicted is an atrophy of the rhomboid muscles. This permits the scapulæ to become winged. The shoulder blades possess abnormal movements and the head of the humeri are in an advanced position. This occurs about puberty, rarely is it noticeable before. Occasionally the patient complains of a dull ache in the shoulders, especially at night after fatigue. As the deformity progresses, the shoulders take a more advanced position. Instead of occupying the normal position with relation to the neck, they are two or three inches in advance. If a line be drawn from the head of one humerus to the other it will be some distance in advance of the neck and chest. The shoulders become bony where they, before, have been plump. Above the clavicles there appear deep hollows and the sternoclavicular junctions, from lack of cover, appear much enlarged. The neck is set in the chest in a peculiar funnellike manner. The back of the neck, from the margin of the hair downward, presents a characteristically flat, straightline appearance.

The atrophy is fairly symmetrical. In a right handed person it is not uncommon to find the right arm shrunken to a greater degree than the left. As the disease progresses the scapulæ become so winged from rhomboid atrophy that they stand out like a pair of fins—they may be grasped in the hands as though they were detached posteriorly from the body. In an erect posture this gaves a lordosis attitude (Fig. 3), the abdomen protrudes forward and the shoulder blades backward. It becomes impossible to raise the arms to a horizontal position. This wasting process lasts from several months to three or four years, then ceases to progress. In this respect it is unlike progressive muscular atrophy. One who has reached the quiescent stage may have a lighting up of the destructive condition. This has been found to be the case in toxemias, pregnancy and undue fatigue.

The loss of strength is in proportion to the degree of atrophy. There is no pseudohypertrophy in connection with the atrophy. There are no sensory symptoms except a dull ache upon fatigue. Neither are there any twitchings complained of.

General neurological examination is negative. Work on electrical reactions has not been concluded at present.

DIAGNOSIS

Numerous forms of muscular atrophy have been described. These differ from the cases under observation either in course, chronicity, muscle groups affected, intensity of impairment and general picture presented.

This particular form may be distinguished by:

1. Hereditary history. One or other of the parents is affected. Those in the family who escape the disease do not transmit it.
2. Develops in early adolescence or under muscle exercise which would ordinarily cause compensatory hypertrophy.
3. Only muscles of shoulders and upper arm involved.
4. Ceases to progress in a few months to three or four years unless other factors—toxemia, fatigue, and pregnancy—are added.
5. There are no fibrillary twitchings or sensory disturbances.
6. Peculiar lordosis attitude, advanced heads of humeri, straight line of neck behind with finned scapulæ.
7. Does not involve face or lower extremities.
8. Does not shorten life.
9. Is not due to syphilis.
10. Reflexes unaltered except diminished in proportion to degree of atrophy in muscles affected.

DIFFERENTIAL DIAGNOSIS

Cerebral atrophy.—Loss of power usually precedes the atrophy, which is either of a hemiplegic or monoplegic type. Also history of intracranial calamity.

Progressive (central) muscular atrophy.—This type begins with the small muscles of the hand. Fibrillary twitchings are present as are reactions of degeneration. These come late in life; the wasting extends to the arms; there is occasionally a spastic condition in the legs and an increase in the reflexes.

Neuritic muscular atrophy.—The mode of onset and general characteristics are distinctive. Cause may be lead or other poisons or trauma. No family history and distribution differs. Paralysis is out of proportion to the atrophy and sensory symptoms are often present. If the legs are involved the stepping gate of peripheral neuritis is seen.

Myasthenia gravis.—This syndrome is not a family one; age from about fifteen to thirty years and usually progresses to a fatal ending. Facial muscles, particularly the upper lid, are involved, causing ptosis, and paralysis of the ocular muscles may produce diplopia, difficulty in chewing, swallowing and phonation develop. There is a rapidly developing fatigue in all the muscles involved. Occasionally the muscles of the neck are involved. This terminates fatally in from three to fifteen or twenty years.

Myotonia congenita (Thompson's disease).—Any group of muscles may be affected but those of the lower extremities are more often involved. Hereditary history is prominent; begins early; is very chronic but not fatal itself; involves muscles by a hypertonus—the muscles are stiff and unyielding but upon exercise the resistance gradually disappears. Does not recover.

This series of cases seems to come into the large and motley group of muscular dystrophies or myopathies. In a search of literature the following varieties are found but differ in some respects:

In Barsickow's group (6) the children remain healthy if the parents are unaffected; is an hereditary affliction; frequently there are winged scapulæ with protrusion of the shoulders or flattening

of the chest but it differed in that it was ushered in by almost simultaneous involvement of both an upper and lower limb or both upper and lower limbs.

In Friederick's group (7) the disease appeared early and progressed rapidly to a fatal termination. The affection began by a weakness in the lumbar muscles. He also reports four brothers whose parents were unaffected but whose two uncles died of it. These cases presented fatalities at the ages of five, six, twelve and sixteen years.

In Gower's (8) cases the disease appeared early, progressed rapidly and was fatal in adolescence. Also, members of a family escaping the disease may transmit it to their offspring.

Erb's types (9) are often combined with pseudohypertrophy. He reports involvement of the glutei and enlargement of the calves.

Other types reported by Prager (10), Bregman (11), Cestan and Lajonne (12), Wirth (13), Claude (14), Marina (15), and others differ in some respects.

PROGNOSIS

The outlook at present in a fully developed case is bad. It has been shown that this is not a disease that kills. Neither does it shorten life. There are a number of victims in advanced years who enjoy good health. The only manifestation of their affliction is deformity and limited, awkward movements, no change having taken place since the breaking down at early adolescence. The natural course of the disease is to arrest at that time unless toxemias, pregnancy or undue fatigue be added. Then after additional involvement the disease again becomes quiescent.

TREATMENT

The treatment is principally expectant and prophylactic. The field of eugenics will supply the first prophylactic measures. Those affected should, in the selection of a mate, look towards one of particularly sound physical and nervous constitution. Avoid an individual in whom "the homologous genes are not strictly identical" as Dr. Danforth says. These families should be instructed as far as is known on heredity because upon them rests the responsibility. Unfortunately many hereditary conditions are kept "in closets" until after marriage, often at the expense of matrimonial harmony in years to come.

All children should be kept under observation about puberty. As it is known that fatigue produces wasting rather than development, these individuals should be spared, as much as possible, exercise involving the arms and shoulders. An occupation which will permit rest of these muscles should be selected. This care should be exercised until a more stable state of life is reached—more stable so far as the great group of endocrine glands is concerned. It is just possible that if these patients can have the susceptible muscles rested during the period of early adolescence, a time in which there is a change in secretion of pineal, testicular, ovarian, mammary, thyroid and other glands, a location sufficiently remote from the usual time of break may be reached that will permit these people to go on without collapsing under the usual factors.

Timme (1) and others (4) have shown endocrine disturbances in the muscular dystrophies. This series of cases also would be under endocrine suspicion owing to the puberty element manifested.

"A careful study of the heredity for endocrinopathic organ inferiority may help in the use of the glandular products" (16). Cases are now being studied systematically by the vegetative method relative to neurometabolic factors. Patients have submitted to gland extract administration and the results remain to be seen.

Jelliffe and White (16) state that testicular and suprarenal lipoids at times stimulate muscle growth. Carnot has experimented with fetal muscle substances with a hope of finding possible regenerating elements (16).

G. Serra (17) restored the function of muscle in twenty of twenty-two rabbits by direct neurotization. This technic enlarges the sphere to secure beneficial results in cases already developed. A spinal nerve or part of it from a healthy muscle may be switched to the affected one. Serra took the entire external popliteal nerve and also merely half of it and switched it to the gastrocnemius muscle, restoring physiological conditions so far as electric tests, myograms and preparations of the muscle and nerve were concerned.

The attempt to investigate this disease has received but little support from the affected families. Rather an attitude to hinder has prevailed, owing to a desire to conceal the skeleton in the family closet. Technical work is scanty and photographs have been almost impossible to secure. However, it is earnestly hoped by the writer that this paper will attract an interest and lead to further study of this disease now entirely neglected.

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Surgery in Nephritics

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Surgical operations in nephritic patients are deserving of grave consideration and cautious performance. These patients are usually in a relatively weakened condition with lessened immunity against infection and increased susceptibility to the complications of operations.

A proper diagnosis of the type, stage of chronicity and grade of severity of the nephritis is necessary to determine the type of anesthesia, the length of operation and the limit within which surgical manipulation must be confined. For this purpose perhaps the most useful is the classification of Volhard and Fahr apparently accepted by E. T. Bell (1), whose practical application of pathology to clinical medicine makes worthy of wide recognition his excellent studies on nephritis.

Under no circumstance should operation be performed unnecessarily, but in a nephritic the necessity must be dire. Unless the surgical procedure will improve the condition of the patient or save life, no operation should be undertaken. When it has been decided to interfere surgically, the kidney function is determined and attention is given to the prevention of the complications of operation. The tests of most significance to the surgeon as explained by Coons (2) are the blood urea nitrogen and the phenolsulphonephthalein excretion. This author considers the phenolsulphonephthalein test as the indication of operative initiative in most cases. With a high phenolsulphonephthalein excretion, one may safely proceed with surgery. In cases of prostatic enlargement or other infracystic obstruction, as pressure of a retroverted uterus, or pelvic growth, etc., catheterization is necessary for the correct interpretation of this kidney function test. A blood urea under twenty mgm. in one hundred c.c. of blood need cause no alarm or worry about the kidneys so far as operation is concerned. With the blood urea reading between 20 and 30, the surgeon must use care. A blood urea over 30 is of grave significance. The nonprotein nitrogen carries the same significance in its interpretation as does the urea nitrogen.

The work of Underhill and Greenhouse (3) on tartrate nephritis indicates that anemia is associated with nitrogen retention. Anemia in nephritics, then, with perhaps a few exceptions means poor kidney function, and for that reason as well as for the weakness accompanying, especial care must be exercised in these patients.

The excellent review of Chace and Myers (4) on the acidosis of nephritis demonstrates that in these cases it is due to a lack of elimination with the resulting accumulation of normally formed substances. The blood is kept fairly constantly at a slightly alkaline reaction through the influence of the bicarbonates, phosphates and proteins of the blood. An increase of the carbon dioxide in the blood induces dyspnea through stimulation of the vagus centres and this eliminates the carbon dioxide, thus maintaining the normal reaction of the blood. By means of acid phosphates, the kidneys are able to excrete an acid urine from a nearly neutral blood. This is the physiological action at fault in acidosis of nephritis. The inorganic phosphates, retained within the body, increase to several times the normal. The body proteins are able to take up large quantities of acid substances without marked change in the alkaline reaction. They also form ammonia which is of considerable importance in offsetting the acidosis. In pathological cases abnormal quantities of bicarbonates are necessary, but too much may raise the plasma carbon dioxide. In severe cases, the judicious use of sodium carbonate will cause the disappearance of dyspnea and hyperpnea.

The foregoing discussions of kidney function, hemoglobin content and acidosis of the blood give consideration to the prevention of the operative complications usually following surgery in nephritic patients. These are mainly hemorrhage, which, with hypertension, may be exceptionally serious: and in the presence of anemia and acidosis—shock. The most important of all complications is a spread of infection in the kidney or an exacerbation of the nephritis. In acute nephritis where the surgical procedure deals with the cause of the nephritis, this risk must be undertaken sometimes without choice. In chronic nephritis, however, a fatal flareup may present subsequent to manipulation of virulent infections. For this reason, a delay must be urged where active infection is anticipated. Anesthesias, as ether and chloroform, will increase the injury to the kidneys confining its disturbance mainly to the tubules, while infection confines its destructive action more to the glomeruli. Both involve other portions of the kidney substance, and when the two are combined in a patient already subject to renal damage, the effect is very serious. The use of local anesthesia with or without nitrous oxide oxygen is for this reason most advisable.

In addition to the elements of hypertension, anemia, nitrogen retention, acidosis and infection—diet constitutes a very outstanding feature in the pre- and postoperative care of a nephritic. As pointed out by Mosenthal (5), Epstein (6), Newburgh (7), Chace and Rose (8), diet may decrease or increase the extent of the kidney lesion and markedly alter the strength or metabolic balance of the patient. Rest, warmth and fluid control are further necessary adjuncts to the surgical treatment of a nephritic.

SUMMARY

It is important to diagnose the type and extent of the renal lesion. With this diagnosis at hand, due consideration must be given the presence of hypertension, anemia, nitrogen retention, acidosis and infection in determining the nature and amount of operative work permissible and to prevent as surgical complications hemorrhage, shock, infection or further kidney injury. Local anesthesia with or without nitrous oxide oxygen is the anesthetic of

choice. Diet, rest, heat and fluid control add medical balance to any surgery performed in a nephritic.

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Donaldson Building.

New Ways for Research Work on Tuberculosis

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Although science and progress seem to be synonyms, science has made hardly any progress whatever regarding its own methods. The way a modern man of science works and studies is not essentially different from that of Aristotle or Archimedes. The modern study is a little bit more comfortable and the modern laboratory a little better furnished than that of the ancients, but their inhabitants seem to have been left untouched by the course of centuries. The only real difference has become a career like any other, open to anybody.

The amount of energy, time and money wasted in science is tremendous. There does not exist any discovery or invention that, on strength of the amount of actual knowledge upon this special subject, ought not to have been made much earlier, and none either that has not to be made twice or three times over again before it is generally accepted. Lack of cooperation and want of discipline in science makes many a generation lose its chance of profiting from a new discovery.

Especially is medical science badly off in the way of development and the health of mankind has to suffer from the consequence. Every country has a medical teaching of its own and every medical teacher preaches another gospel than his foreign colleague. Medicine, too, has become a question of patriotism even more than one of science, and a truth that is not home made is kept in the dark as long as possible.

If we think of tuberculosis we ought to be ashamed of ourselves and not boast any more of scientific progress in medicine. Countless books have been written on this disease. Many doctors have devoted themselves exclusively to its treatment and still we are not yet able to prevent people from dying of tuberculosis. All we have learned is a symptomatic treatment of the disease by gathering tuberculous persons in dispensaries and by shutting them up for some time in sanatoria. That is the real aspect of the progress in antituberculosis work, of which we are so very proud.

We should soon know better if we would only allow Nature to become our teacher. We would then realize that there exists an antituberculous immunity and we would try to imitate it. But most of us do not believe in antituberculous immunity any more since tuberculin has failed to satisfy our legitimate hope. As late as 1921 Uhlenhuth, Klemperer, Wassermann and Neufeld made the Congress of Internal Medicine in Wiesbaden and the Congress of Tuberculosis in Bad-Elster unanimously vote that there existed no proof of the reality of an antituberculous immunity.

He who does not believe in immunity against tuberculosis can never hope to find a way of immunizing man or beast against tuberculosis. He will consequently profess a dangerous nihilism that would doom mankind forever to die of tuberculosis. But happily nature is less cruel than man. Day by day it teaches us the reality of antituberculous immunity if we were only to pay heed to simple facts, instead of listening to scientific theories.

Burckhard, Naegeli and many other authors have proved that out of a hundred postmortem examinations, ninety reveal the existence of tuberculosis. As only ten per cent. of all mankind actually die of tuberculosis, eighty per cent. of them must have overcome the infection with tubercle bacilli, i. e., they must have become immune against this disease.

Loomis examined the bronchial glands of fifteen patients who had died of acute diseases, but not of tuberculosis, and found in six of them living tubercle bacilli. Pizzini obtained the same results by the careful examination of forty persons and Spengler demonstrated the presence of virulent tubercle bacilli in the glands of six children that had died of diphtheria and other conditions.

All these researches prove that the presence of tubercle bacilli in the human body does not necessarily mean tuberculosis and that we are endowed with a remarkable degree of immunity against this disease. The possibility of an antituberculous immunity alone can make us understand the marvellous effect of the high altitude cure in even advanced cases of tuberculosis. Every one of us will remember at least one case where that cure has restored fully and definitely the health of a tuberculous patient, and this one case can not but teach us that antituberculous immunity is a fact, that sooner or later we must and will learn to reproduce it at will.

Hitherto all our endeavors experimentally to im-

munize man or beast effectually against tuberculosis have remained unsuccessful. This failure is all the more astonishing as the germ of tuberculosis was discovered many years ago. It seems as if Koch's bacillus were not subjected to the microbiological laws, the observation of which has allowed us to master a great many of other infectious diseases. In tuberculosis there exists no agglutination test as in typhoid fever, no complement deflection as in syphilis, no vaccine as in rabies and no serum as in diphtheria.

Taking into consideration that there does exist an effective antituberculous immunity and that the laws of nature suffer no exception, our failure in converting the tuberculous weapon into an antituberculous armor can only be caused by some fundamental error about the biology of the tubercle bacillus. To find out that error would mean to open a new pathway to research work in tuberculosis, that seems to have come to a deadlock years ago.

As Koch's bacilli behave quite differently from all the other pathogenic germs and as we want to find an explanation for this exceptional behavior, it seems necessary to review all its well known biological properties, hoping to find out one that distinguishes it from those pathogenic germs that have already yielded to our methods of immunology. This special property might become the key to the secret the tubercle bacillus has guarded so jealously until now.

One peculiarity of the tubercle bacillus and its most striking one is its acid resistance. This property of not being easily stained by aniline dyes and of keeping that stain tighter than any other microbe is due to its waxen fatty membrane. Perhaps it is just this membrane that gave the tubercle bacillus its exceptional position in immunology. As in spite of so many endeavors the acid resistant tubercle bacillus could not be converted into an immunizing antigen, and as on the other hand immunity does exist in tuberculosis, natural antituberculous immunity is possibly not produced from this acid fast germ, but from some other form of the tuberculous virus.

Starting from this point of view we tried to find out if this fatty waxen membrane forms an integral part of the tubercle bacillus or not. We therefore tried to remove the fatty waxen substances, a procedure that several investigators had carried out before, though with quite another aim. They either wanted to know the exact amount of fatty waxen substances of the tubercle bacillus like Hammerschlag, or they wanted to study them like Goris, or they just wished to see what happened, if they defatted it, like Aronson and Uhlenhuth (2). All these experiments meant the application of wellknown chemical methods, but these routine methods of chemistry would not have done for our purpose of investigating if the tubercle bacillus could do without its fatty waxen membrane. All these methods were too radical and would in the same time have destroyed or altered the albuminous nucleus that we just wanted to keep intact.

We therefore applied a method that we had found useful in the purification of smallpox vaccine (3, 4). We had then observed that the vapors of ether and other fat dissolving liquids possess a far greater dissolving power than the liquids themselves, while they left the albumen absolutely intact. Treating an emulsion of tubercle bacilli energetically with vapors of ether, we saw that the bacilli were killed within less than ten minutes, while it takes the liquid ether many hours to sterilize such an emulsion. When we continued this process for some time, the tubercle bacilli began to lose their acid resistance and an emulsion thus treated by vapors of ether would soon settle in three distinct layers. The bottom layer contained unaltered, acid fast tubercle bacilli, the middle portion represented an emulsion of partly defatted tubercle bacilli and the top layer was formed by a thick stratum of fatty cream.

If the acid fast membrane represents no vital part of the tubercle bacillus its removal must have left unaltered its biological properties and their experimental demonstration must even have become easier without that membrane. This supposition proved to be true. The emulsion of defatted tubercle bacilli is in fact specifically agglutinated by serum of tuberculous persons, but not by that of healthy individuals. When used as antigen in Bordet's complement deflection it prevents hemolysis together with antituberculous serum. When injected into animals it causes the formation of agglutinines and other immune bodies. When administered to tuberculous animals or persons it seemed to influence the course of the tuberculous infection favorably.

We have had no opportunity of studying the important question of the prophylactic and therapeutic value of these defatted tubercle bacilli more closely, and we had to content ourselves with agglutinating tests that we carried out on a large scale. The emulsion of defatted tubercle bacilli soon became a valuable help for the detection of tuberculosis and for the control of tuberculosis under treatment. This tuberculodiagnosis was also successfully used by school doctors.

That the fatty waxen membrane represents no vital part of the tubercle bacillus could further and definitely be proved by the observation, that defatted tubercle bacilli will still play an important part in the prevention and treatment of tuberculosis, as well as vaccine as antigen for the preparation of an antituberculous serum.

The fundamental fact that the waxen fatty membrane of the tubercle bacillus may be wanting and that the naked defatted tubercle bacilli represents the two and perhaps the only useful tuberculous antigen has been fully confirmed by Wassermann (2) and quite recently by Dreyer. Wassermann removes the fatty substances by treating tubercle bacilli for several months with the fat dissolving tetraline together with liquid ether instead of its vapors. Dreyer obtained the same effect by boiling the tubercle bacilli for four or even twelve hours at 100° C. together with formalin and acetone.

It is most astonishing to see that in Dreyer's experiments the tuberculous antigen, unlike any other microbiological antigen, proved to be so resistant to heat and that the tuberculous albumen should not have been coagulated at 100° C. We must examine with great care any further publications of Professor Dreyer on this point. This noncoagulabil-

ity of the tuberculous albumen represents the really original part of Dreyer's discovery, unless his remarkable results should be due to a greater or lesser extent to the effect of a protein therapy with the defatted and boiled albumen of tubercle bacilli.

The new facts about the biology of the tubercle bacillus, described by us in 1921 and confirmed by Wassermann and Dreyer in 1923, might have become known and be put into practice many years before if there existed something like a scientific collaboration. Nonacid resistant, i. e., defatted naked tubercle bacilli, have in fact already been seen and described by a great many authors, of which we quote as the most important ones: Gottschlich and Ehrlich (1886), Metchnikoff (1888), Ferran (1897), Marmorek (1901), Much, Auclair and Paris (1907), Betegh (1908), Maher (1910), Frei and Pokschischewsky (1911), Benians (1914), Dixon, Wherry and Shermann (1913), Dostal (1916), Vaudrener (1921). If the careful observations of these and other investigators had not been systematically neglected and if the fact that so many workers had independently from each other come to the same result, had been taken into conscientious consideration, we should most probably have efficacious and generally adopted methods for the eradication of tuberculosis.

There are various reasons to believe that wherever any tuberculous antigens have practically proved to work less unsatisfactorily than the majority of all the other socalled preparations, derived from Koch's acid resistant bacillus, that all their authors have actually worked with tubercle bacilli of a diminished acid resistance. That seems especially to be true with Calmette's and Besredka's antigen for complement deflection with the homogenous culture of Arloing-Courmont, with the therapeutic preparations of Ferran, Friedmann, Dostal, Marmorek and Spahlinger.

Among these authors Ferran and Marmorek are the only ones who have realized this fact themselves and intentionally have selected primitive or alpha forms among their tubercle bacilli.

It is to be hoped that, now general attention has been drawn to the importance of defatting the tubercle bacillus before using it as antigen for diagnostic, prophylactic or therapeutic purposes, that a collaboration of all those workers specially interested in this question will establish itself at last and that the practical result of this collaboration will soon make good for all the time and labor lost by undisciplined research work. In fact, it would be worth while if the hygienic section of the society of nations or any other international institution were to take over the promising task of promoting and organizing this international collaboration of antituberculous research work.

A complete bibliography will be included in the author's reprints.

An Aid to Early Diagnosis of Pulmonary Tuberculosis

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We all agree that the prognosis of an ultimate complete recovery in tuberculosis is the more favorable the earlier the tubercle bacillus is discovered. Many cases of an active tuberculosis have shown again and again a negative result in sputum examination. This was not due to any neglectful or cursory examination of the slides, but to the old method of staining with carbolfuchsin, the Ziehl-Neelsen method of staining tubercle bacilli.

Just lately two cases of tuberculosis came to my notice where the fallacy of the Ziehl-Neelsen method was plainly demonstrated. In each case a number of slides were prepared at four different occasions and all showed a negative result. In using the Schulte-Tigges method the very first slide proved positive for tubercle bacilli, in both instances revealing a Gaffky No. IV (two to three bacilli in each microscopical field).

For the benefit of those who are not familiar with the Schulte-Tigges method, I will give it in full:

SCHULTE-TIGGES METHOD

1. There is no need of making a thin slide; a fairly large particle of the sputum is placed upon a slide and distributed by rubbing another slide against it, making a fairly thick layer of sputum on each slide, which has the advantage that we have two slides in less time than it takes to make one.

2. Flood the slides with carbolfuchsin (ten c. c. of saturated solution of basic fuchsin in nineteen per cent alcohol, and ninety c. c. five per cent. carbolic acid).

3. Heat the slide to steaming and continue the heating for one minute. Avoid slide getting dry through excessive heating.

4. Wash off the excess stain with tap water and decolorize in sodium sulphite (ten per cent. aqueous solution of sodium sulphite). This solution should be renewed at least twice a week. Care should be taken that the slide is completely decolorized.

5. Wash thoroughly with tap water, and counterstain with picric acid. (Saturated aqueous solution of picric acid).

6. Wash with tap water and dry, and examine. The tubercle bacilli are red, the background is pinkish yellow. It will be noted that the Schulte-Tigges method is not more difficult than the Ziehl-Neelsen method, but the results reveal from thirty per cent. to fifty per cent. more positive sputum than in the latter method.

Therefore, in the interest of our patients, whenever we suspect a tuberculous pulmonary lesion and a sputum examination is made, the Schulte-Tigges method of staining should be insisted upon.

110 WEST THIRTY-NINTH STREET.

Shoeing

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An inspection of feet in a large hospital clinic, not only those that come to the orthopedic department because of symptoms arising directly or indirectly from the feet, but also the feet that are seen throughout the hospital, show deformities and defects which are undoubtedly caused by the improper fitting of shoes.

This improper fitting is done not only in the small shoe stores, but in the largest and best shoe stores of the country. Many of the shoes manufactured today are excellent if properly fitted, but undoubtedly there are now manufactured many shoes labeled with orthopedic names which are dangerous, and simply freak shoes. These shoes will not be discussed or analyzed in detail in this paper, but simply the glaring defects in such shoes, as a class, will be pointed out.

RESULTS OF IMPROPER FITTING

Shoes are fitted too short and too wide. This extra width is used to get the foot crowded further forward in the shoe. The common defects that are caused by this short shoeing are crumpled toes, hammer toes, toes that are moulded one into the other so that they are creased, hallux valgus, bony outgrowths on the first metatarsal head (with or without bunion), spreading of the metatarsal shafts, toes that are flexed on the dorsum of the foot and curled, callouses on the knuckles of the little toes, callouses under the heads of the metatarsals, anterior metatarsalgia, humps on top of the foot at the junction of the first metatarsal with the internal cuneiform, pronated feet, flattened feet, and shortened tendo-Achilles. Besides these there are some other defects not mentioned, not only of the feet, but of the hips, knees and ankles, which are directly dependent upon the shoeing, and the resulting foot defects.

To be able to walk properly, the shoe must fit the foot, not bind it. There are plenty of good shoes in the shops that will fit almost every foot accurately. If there is any criticism of the stock carried in the shoe stores it is that the narrow sizes are not to be found. It is not my purpose to recommend any make or model of shoe, as stated there are many good models—but to point out that it is possible to ruin people's feet by improper fitting when the shoe used is of excellent shape and model. It is not the model in many instances,—it is the way the shoe is applied to the foot that does the harm.

During the war, in the Army, we had the Munson last, an excellent shoe, and yet, by improper fitting, much harm was done and many men were temporarily made incapable of duty by improper shoe fitting. Correct fitting relieved these men, and eventually enabled them to return to duty.

MOTION IN THE JOINTS OF THE FOOT

The metatarsal phalangeal joints and the joints between the phalanges (the junction of a condyle with a slightly cupped end) are capable of considerable upward and more downward swing. There is a slight lateral motion, and a little rotary motion at these joints. But the tarsometatarsal and midtarsal joints are made, with the exception of the scaphoid to the astragaloid head, by flat surface opposing flat surface, and these joints are not capable of any upward and downward swing, but are simply shock absorbers. The lateral swing of the foot takes place chiefly in the subastragaloid joint, around the head of the astragalus as a pivot. The motion of the foot in dorsal and plantar flexion is at the tibio-astragaloid union.

FAULTY AND FREAK SHOES

The shoes with inwardly twisted front, that is, when the front of the shoe is swung inward from the longitudinal axis of the body of the shoe, are freaks. A shoe is a housing for the foot, and the front of the foot does not swing inward as these shoes do, but extends straight forward. When a foot is put into these intwisted shoes, the small toes are cramped inward and there is an empty bag of leather on the inner side of the great toe. If this empty bag is pressed down inside the great toe, you will find the toes are crowded into a stubby, pointed space.

THE SHOE WITH A FLEXIBLE SHANK

The midtarsal and tarsometatarsal joints are not capable of any great excursion of motion. As mentioned, they are square ended, and are simply shock absorbers. Shod in a shoe without a shank, when this portion of the foot comes down under a load, it meets a surface which immediately drops away from under it, for there is nothing for the midfoot to rest on. If there is no heel, the ground furnishes this surface, as in a moccasin, tennis shoe or sneaker. But a stout steel shank is a necessary accompaniment of a boot heel, and the shank must reach from the front of the heel way forward to where the tread rests on the floor. A foot does not need to be held up, but a surface must be furnished on which it can rest. Light and active people may, perhaps, get along in shoes without shanks, but had the soldiers, carrying heavy packs, been shod in shoes without steel shanks, we should have had an army of cripples.

PLACING OF THE FOOT IN THE SHOE

The human foot has a flat, anterior portion, the toes. This portion begins at the metatarsal phalangeal junction and extends forward. It is thicker on the great toe side. The broadest point is from about the middle of the great toe straight across to the tip of the little toe. This is the normal foot, but, unfortunately, many feet have been so crowded forward into the toes of shoes that the little toe no longer stands out, but is curled against, or sometimes under, the fourth toe. The foot should be so placed in the shoe that the tip of the little toe comes at the very widest part of the sole. This will bring the

distal end of the second, third, and fourth metatarsal heads just under the region of the vamp seam, and the anterior flat portion of the foot will be in the anterior, flat portion of the shoe. The amount of empty space beyond the ends of the toes will vary with the length of the toes and the style of the shoe. Roughly speaking, there should be an inch of empty shoe beyond the ends of the toes in the blunt toed shoes, such as the Munson last; with short toes there will be more room, with long toes, less. In pointed toed shoes there will be more than an inch.

When the region of the vamp seam crosses the foot at the metatarsal-phalangeal junction the head of the first metatarsal is behind this seam and comes into the pocket made by the rising of the shank and the cutting in of the sole at the front end of the shank. This puts the most prominent point of the first metatarsal head just above and behind this rounding corner of the sole. The head of the fifth metatarsal will then occupy a less deep corresponding pocket on the outer side of the shoes.

The counter of the heel and waist of the shoe should fit closely against the sides of the heel and foot, not to squeeze it, and be of such width that there is a space between the lacing, for the lacings should hold the foot back in place against the counter. The foot should never be held back by pressure on top of the foot over the metatarsal shafts or heads, by the vamp seam. In fact, when fitting a shoe, before lacing, it should be seen that there is a space above the foot at the vamp seam when the whole body weight is put on the foot.

When people enter a shoe store and a clerk approaches with a measuring stick and measures their feet, they must remember that they are dealing with a clerk, a salesman,—but only in rare instances with a man who really knows the first rudiments of fitting. People must learn for themselves how to shoe their own feet,—where the foot should be placed in the shoe. A shoe that fits is as comfortable when new as it is the day it is thrown away. The process of breaking in new shoes is really moulding the feet as well as the shoes.

Adenosarcoma of the Right Tonsil Cured by Radium Emanation Seeds*

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CASE.—E. N., female, eighty-one years of age, in fair health. Examination of the throat revealed a large mass the size of an orange protruding into the pharynx and extending downward toward the neck to the under surface of the right lower jaw. The mass was easily palpable, externally. The patient gave a history of having noticed the growth of the tonsil three months previous to the beginning of the treatment. She complained of difficulty in breathing. At night she experienced a sensation of choking and her sleep was considerably disturbed. There was also a marked mechanical interference in swallowing. On physical examination another mass, the size of a large grapefruit, was found in the left groin. This mass was probably malignant in nature, since it was infiltrating and adherent to the surrounding tissues.

On April 25, 1923, the tumor mass of the throat was injected with two per cent. novocaine solution and thoroughly anesthetized, then emanation "seeds," consisting of small glass capillaries containing radioactive substance, were imbedded in the mass. Four seeds of one millicurie each were inserted through an instrument into the centre of the new growth and three seeds containing one half a millicurie each were then inserted around the mass. There was no bleeding or any other discomfort to the patient. (Figs. I and II.)

The small glass tubes are placed inside of a hollow needle through which a plunger is thrust. The tube as well as the needle and plunger are sterilized by boiling. After inserting the needles into the tumor they are withdrawn a few millimetres to leave a small channel, thus avoiding the danger of breaking the tube.

On April 28th, three days after the implantation, an observation was made and the tumor found considerably reduced in size, so that the uvula, while resting on the tumor mass originally and considerably deviated to the left of the median line, was free. The tumor at this time was easily reduced to one half of its original size.

Another observation was made on May 7th. At this time the anterior and posterior pillars of the tonsils were plainly visible and the throat was free from the tumor mass, also the mass was not palpable externally. At this time the patient complained of slight malaise and pain on that side of the throat. There was slight superficial sloughing and the patient was directed to use an antiseptic mouth wash. (Fig. 3.)

The last observation on May 14th showed no tumor mass and the patient was entirely free from symptoms. Her swallowing was not interfered with; her breathing was easier, and her general condition was good.

The advantage of using emanation seeds in preference to radium itself may be tabulated as follows:

1. Radium is not accessible to all practitioners and it requires special technic with a thorough knowledge of the quality and action of the rays before one can be qualified to apply it; while the seeds when charged with the radioactive substance and carefully calculated are easily applied, when the tumor is accessible.

2. The emanation may be put into any con-

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FIG. 1 FIG. 2 FIG. 3

FIG. 1.—Adenosarcoma of the right tonsil, front view. April 25, 1923.
FIG. 2.—Lateral view of the tumor protruding externally. April 25, 1923.
FIG. 3.—Photograph of the mouth. Complete disappearance of the tumor mass. Anterior view. May 7, 1923.

tainer, shape, size and strength calculated according to needs.

3. The volume of emanation is extremely minute as compared with the volume of radium that will be required to produce the same intensity of radiation.

4. The small tubes of emanation may be left in the tumors indefinitely. Although the tubes may contain high concentration originally, the strength is greatly reduced by disintegration.

I wish to express my thanks to Dr. C. N. Gelber and Dr. Joseph Muir for their cooperation in making the report of this case possible.

182 LEXINGTON AVENUE.

Galvanic and Faradic Electricity and Derived Currents in General Practice*

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(*Concluded from page* 6)

The question naturally arises at this juncture as to how we are to obtain the electrolytic action characteristic of one pole to the exclusion of the effect from the other pole, since the current flows equally everywhere throughout the circuit. We take advantage of a physical law, true everywhere as in electricity, that a certain applied energy, if concentrated upon a small area with terrific effect, may be made harmless by dissipating over a large area.

Our treatment electrode is called the active electrode and is just of sufficient area to apply the density of current desired, and this is attached to the pole whose effect we desire to obtain. The other electrode, which is called the dispersing or indifferent or inactive electrode, is much larger and is usually applied on the abdomen or back where there is a large surface. If our active electrode have one square inch of surface in contact with the body and the inactive electrode have one hundred square inches, then if our current be of five ma. strength, there will be a concentration of the five ma. on the one square inch at the active electrode, but each square inch under the dispersing electrode will have only five one hundredths ma. or one twentieth ma., which is negligible in its effect.

When desiring only the polarity effect of our active electrode, we use platinum, gold or carbon electrodes, which are ineffectively electrolyzed with either pole; copper, zinc or silver, as our active electrode, when employing the negative pole. In either event, if used bare, they will cause the characteristic caustic effect of the pole. They must be covered with a bibulous substance to prevent this effect. If we use on the covering a solution of our medicament, say a metallic salt and then use an electrode of the same metal for the active electrode and apply it as the positive pole, we will enhance the iontrophoretic effect.

When a current of appreciable quantity is suddenly sent through a wire circuit there arises around the wire a cylindrical field of force, called the electromagnetic field, with a definite polarity, which may be proved by a magnetic needle brought within its influence or by the classical experiment of the iron filings. When the current ceases to pass, this mag-

*Read before the Medical Society of Bay Ridge, N. Y.

netic field of force collapses into the wire. Should another wire, even if insulated, be placed at right angles to this field of force an electrical impulse or flow of electrons would take place in the wire in one direction when the field of force arose, and in the opposite direction when the field of force collapsed. This is called induction.

Again, the sudden make and break of the current will just as suddenly start and stop the electrons in the first wire.

If the body be a part of the electric circuit, when the current is abruptly made and broken we have a sudden impulse and arrest of motion of the hydrogen ions combined with the rise and collapse of a field of magnetic force in the tissues, which incite heat and pain with consequent muscular contraction and the degree of both would depend upon the polarity of the exciting electrode, the milliamperage used and the abruptness in arriving at the full strength of the current, together with the rhythm periods of the interruptions. While the current flows there is no interpolar effect of irritation and no neuromuscular response, only heat and increased blood flow. There are, however, polar effects.

From these facts we derive the following suggestive ideas:

First, when giving galvanism we must always go from zero to the intended milliamperage slowly and likewise when finishing the treatment the current is reduced to zero gradually.

Second, we can make use of this reaction in the diagnosis of abnormal nerve muscle conditions; and

Third, we may use this interruption in a rhythmically repeated manner for treatment purposes.

The character of the physiological response is governed entirely by the frequency of the interruptions and the relation between the period when the current is flowing and when the current is not flowing.

The most interesting interrupted current is called after its proposer, the Leduc current. It is obtained by interrupting a direct current of only one or two milliamperes up to about one hundred times per second. By this current Leduc claims that he can produce experimentally in animals single muscular contractions, tetany, local anesthesia, general anesthesia, which he calls electric sleep (7), coma, paralysis of the heart and respiration, and finally death.

The anesthetic action can be explained, says Turrell (8), "by the exhaustion of the sensory receptors by overstimulation, a phenomenon similar to that of the fatigue resulting in the recovering end plate of motor nerves from electrical overstimulation, the overstimulation in each case being occasioned by the frequently recurring hydrogen ion concentration." We must remember that the current has polarity, therefore to prevent polarity effects we must use equally sized large area electrodes.

The infrequently interrupted galvanic is nutritional and developmental in its action because there is a longer time for the flowing current to have its effect. The socalled interrupted galvanic of many machines is one in which there is a momentary flow with a long period of intermission. A variation on this modality is the interrupted galvanic surge, in which the milliamperage rises and falls between maximum and zero at a regular rhythm with a regular period of rest between. Such a current in effect is the one of Lapicque, which is used to exercise a paralyzed muscle without exciting contractions in neighboring antagonistic healthy muscles. The necessary strength is obtained with the most cautious gradual increase of current.

We now come to a consideration of alternating currents. These are really rhythmic surges of alternating reversal of polarity. The result is that we have only the interpolar nutritional and exercising effects, without polar chemical effects, as each succeeding surge neutralizes the polarity effect of its predecessor. When expressed graphically the flow of current represents a sine wave, hence the name of galvanic sinusoidal.

The current is purely mechanical and intended for exercise only with its resultant nutritional and developmental effects. It must not be attached to a paralyzed muscle for extensive application and it must run in slow cycles, a few per minute, corresponding in rhythm to the time of ordinary contraction and relaxation of the parts; of the abdominal muscles for example in rhythm with respiration. When used for relaxing fibrosis or for expressing exudates from contractible tissues the rate may be increased.

As we increase the frequency rate of alternations, we of course increase muscular response, until we get to a point where the muscle cannot relax before the next contracting impulse arrives and hence we have tetany. If the alternations increase to beyond ten thousand alternations a second, no muscular response is perceptible.

We note with the use of the galvanic sinusoidal current a painless contraction of physiological character as obtained by the rhythm of the reversal, which causes increased nutrition of the muscle and when applied to large groups of muscles tends to relieve the heart, slow the pulse, increase metabolism, reduce adiposity and raise blood pressure all without fatigue. On the contrary after a patient undergoes this treatment upon the Bergonié chair for the reduction of obesity there is a feeling of vigor and refreshment. This is also a good treatment for any tired muscles, as in Charley horse or lumbago, or during convalescence.

There are two apparatuses on the market with special names which give alternate rhythmic surges having the effect of the galvanic sinusoidal. They are the Clonophore and the Morse. Their action is purely mechanical.

The next type of alternating current is an induced current coming from the secondary coil of an induction apparatus called a faradic. Its characteristics are a high voltage, a very low milliamperage, and a very rapid alternation with a faint polarity. The voltage can be increased at the expense of the milliamperage by pushing the secondary over the primary coil. The more lines of force from the primary cut the coils of the secondary, the higher will be the voltage, the lower the milliamperage and the more painful and stimulating will be the muscle response.

Gaiffe of Paris makes a machine in which the secondary swings backward and forward over the primary thus giving a surging effect. A combined galvanic and faradic current, called the DeWatte-

ville, was invented to give more volume and add polarity.

None of these derived currents, save the galvanic sinusoidal, have held the field in the face of the static and high frequency modalities. In considering the indications for these various currents we are guided by the physiological response to a large degree and also by the clinical evidence.

I have thought it well therefore to present some clinical evidence herewith.

CLINICAL DATA

Sinclair Tousey and W. M. Clark have in different places testified to the sclerolytic effect of the negative pole at three to fifteen ma., especially when it is of adequate size, in the softening of scar tissue, especially superficial fibrosis from burns, scleroderma, Dupuytren's contracture and false ankyloses. While they suggest that chlorine iontophoresis may be decidedly helpful, it is not operative in deeper parts.

For superfluous hair the negative pole is used, but it is a treatment which may well be left to the beauty parlors, as it is tedious, taking sometimes a year to accomplish complete results. Again small hairs are stimulated to grow and require removal.

For alopecia Shoemaker (9) advises the Scotch douche with shampooing and three or four milliamperes of negative galvanism either through the moist hair or by a metallic bristled brush. The current is increased to tolerance. The faradic is used similarly with the brush until the scalp is quite erythematous.

With sebaceous cysts a bipolar electrode applying an electrolytic current of great density or a monopolar needle electrode as negative pole can both be used, the effect being a softening of the contents and destruction of the lining membrane. Birth marks, port wine stains and other forms of nevi are treated with electrolysis and bipolar electrodes, small areas at a time, allowing the reaction to subside. For acne and acne rosacea zinc or copper iontophoresis, five to twenty, is used for each comedone. Boils and carbuncles yield readily to the same treatment.

Erysipelas, according to Clark (*ibid*), is amenable to magnesium iontophoresis, five to fifteen ma., used daily. Chronic ulcers of the legs and beginning small epitheliomas yield to zinc iontophoresis. Leduc uses two ma. to the square centimetre of surface and an application of fifteen to twenty minutes. Cocaine, also by iontophoresis, may be necessary. The surface of the ulcers is covered a dead white by zinc deposit. A little later the surface turns red and is somewhat inflamed for about a week. Soothing applications are required. Several applications are usually necessary.

The nerve conditions which most commonly call for the use of constant current are neuralgia, neuritis, paralysis and muscular spasm. These are usually associated in groups, plexuses or ganglia. In injuries and diseases of the nerves the constant current is of great importance in making diagnosis and prognosis. The reaction known as the reaction of degeneration and which appears in Wallerian degeneration is one which we have not space to give, but it also allows of a prognosis as to length of convalescence and degree of recovery.

An early diagnosis permits relief of a beginning neuritis before paralysis and fibrosis occur and wasting enters the picture. This is most important and is a point on which the medical profession in general is in error, since almost invariably the surgeon or internist believes that early use of electricity in any form is harmful, while later it may be allowable. I leave it to your judgment whether an exudate is not more readily removed while still fluid and plastic than after it is organized and fibrotic.

In brachial neuritis a large dispersing electrode is placed on the cervical vertebræ with a smaller anode in the supraclavicular space, especially including any tender spots. Five or six ma. are passed for five minutes. A roller electrode may be used. These treatments will have their greatest effect and greatest value during the acute stages. If given early the pain, inflammation and tenderness will often disappear in a remarkably short time and no paralysis or atrophy need be expected.

With the sciatic nerve and its distribution a longer time and stronger currents will be needed. A large cathode is placed on the sacrum or lumbar vertebræ and a foot tub containing hot salt water is used for the anode. The treatment is ten to fifteen ma. for ten minutes, or stronger, if agreeable. Roller electrodes may be used for the active pole along the sciatic, especially on the tender spots.

The same general plan is pursued in trigeminal or multiple neuritis, intercostal neuralgia and herpes zoster. In the vomiting of pregnancy the positive pole is applied over the clavicle and the negative over the pit of the stomach. It is almost invariably successful, according to Neiswanger.

Leduc and others report a certain number of cures of tic douloureux. A two per cent. solution of sodium salicylate is applied by the negative pole to the part of the face affected and a current of twenty ma. is given for an hour. The effect here, however, must be ascribed, not to the iontophoresis, since the pathology is too deep seated to be affected by the drug so administered, but to the interpolar heat and hyperemia.

W. J. Turrell, of Oxford, England, reports the use of the Leduc current with complete success in relieving causalgia in veterans—after all other methods tried had failed, notwithstanding the fact that in the British Research Committee's report on the diagnosis and treatment of peripheral nerve injuries, referring to the treatment of causalgia, the following passage occurs: "Little benefit can be hoped from electricity."

In the treatment of paralyses great care must be exercised in grading the dose to the weak muscles. An overdose is as bad as a whip to an exhausted animal. If we have merely an atony from disuse, then we may be a little bolder in our use of the sinusoidal galvanism. It is injudicious to employ galvanism in hemiplegia until after a period has elapsed to permit the clot or embolus or what not to attain a degree of restitution, though it may be used over the muscles to prevent atony. In the toxic and postinfectional palsies, as well as poliomyelitis, galvanism to the nerve area and sinusoidal galvanic to the muscles make a good team.

In all cases of spasms and contractures the sedative anode is indicated. It is not invariably successful.

In genitourinary conditions these currents are

sometimes employed. Paralysis of the bladder, incontinence of urine, functional impotence, spermatorrhoea and frequent nocturnal losses, renal colic, simple hypertrophy of the prostate are all benefited by faradism. In orchitis galvanism followed by faradism affords some relief in pain by absorption of the swelling.

In urethral and ureteral stricture negative electrolysis is specific, and in gonorrhoea zinc iontophoresis is very efficacious. Negative electrolysis of hydroceles is done by puncture, using twenty to fifty ma.

In gynecology these modalities have their most happy effects and it is surprising that the gynecologists have continued to practise surgery for conditions which are remediable by electrical means. The evidence is good, sufficient and can be repeated by any one who informs himself upon the subject. A careful perusal of Sloan's work on gynecology or Dr. Massey's books and numerous writings will find ample justification for this statement.

The following conditions are curable by copper or zinc iontophoresis: vulvitis, vaginitis, endocervicitis, endometritis, salpingitis and gonorrhea.

The positive pole positively controls hemorrhage and in the case of fibroids is doubly efficacious without sterilizing the woman.

The treatment of fibroids is at present a contention between surgeons and radiologists. Radium and x ray having possibly the best of it, but Apostoli developed a galvanic technic by which he obtained a permanent benefit in ninety-five per cent. of these cases, results which were repeated with even better success by Keith of London and Massey of Philadelphia.

The technic is simple but must be adhered to. Using a nonionizable positive electrode in the uterine cavity, a current of thirty to forty ma. is very gradually turned on, remains at this point for a few minutes, then is increased cautiously. Usually fifty ma. will be sufficient for the first treatment. On the first sign of pain the current should be reduced. The maximum is maintained for about ten minutes. Later heavier currents may be employed, but with a reduction in time. The patient must expect colic and increased discharge for the next twenty-four hours, and rest in bed is highly advisable. The treatments are given three times a week, or less if necessary. Sometimes fibroids are treated through punctures through the vaginal vault.

Massey gives the following contraindications for this procedure: Menstruation, pregnancy, an abscess in any pelvic organ, acute metritis or perimetritis. Dysmenorrhea due to infantile uterus is much benefited by negative intrauterine galvanism and the galvanic sinusoidal. In other cases due to inflammatory exudates Apostoli's method is indicated; in subinvolution with a boggy uterus the positive galvanic treatment is specific. In amenorrhea negative galvanism is indicated, using five to fifteen ma., followed by faradism; of course, any anemic cause must be corrected. The faradic current is recommended in threatened abortion and in placenta previa, but only with mild currents (premature delivery may be brought on by strong currents), also in subinvolution and prolapse.

This is but a sketch of electrotherapy in gynecology, and to those interested I can with heartiness recommend the books of G. Betton Massey of Philadelphia and Samuel Sloan of Glasgow.

We shall now hastily review some other conditions. Of late we have been hearing about the viscerosensory reflexes, and quite a little has been gained from knowledge of Head's zones and Abram's spondylotherapy and the work of Arnold Snow. Certain reflexes are now established whereby internal organs may be affected by stimulation of certain skin areas or intervertebral spaces upon the posterior nerve roots directly, not alone by pressure or vibration, but also by incandescent radiation and, what interests us here, faradism and galvanic sinusoidal applications. Gastralgia, cholecystitis, splanchnic neurasthenia, and even visceroptosis; blood pressure and heart rhythm are influencible by these applications to appropriate intervertebral spaces.

In myalgia or myositis, torticollis and other spasmodic conditions the faradic current often has a soothing effect. In headaches, such as migraine or from neurasthenia or gout, or in cases of insomnia mild galvanism will frequently give relief, if applied from nape of neck to forehead. The bitemporal application causes dizziness and syncope.

In diseases of the ear attended with acute infections zinc iotophoresis is very valuable, while in sclerolytic conditions chlorine ions or simply negative galvanism are suitable. Polypi are amenable to electrolysis.

In catarrhal conditions of the nose and throat with swollen mucous membrane the positive pole shrinks and relieves and the use of zinc iodide by either pole is antiseptic.

In infectious diseases of the conjunctiva the copper ions are indicated and cocaine, eserine and homatropine can be introduced by iontophoresis. Pterygium is removable by electrolysis, using a fine platinum needle. Faradism has been used in choroiditis and interstitial keratitis according to de Schweinitz.

I regret that space has compelled only a review of the subject, and I wish also to emphasize the fact that while by these treatments the results mentioned are obtained, other physical means, as high frequency and static electricity, ultraviolet and caloradiance, x ray and radium are equally and often more efficacious, nevertheless the inexpensive portable galvanofaradic battery in the doctor's car will give wonderful service where other agents are lacking.

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850 SEVENTH AVENUE.

Practical Therapeutics

AUTOSERUM TREATMENT OF CHOREA*

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In 1917 I made a report of three cases of chorea (minor or Huntington's chorea) treated with autoserum and described the technic of the treatment in detail.

At that time I discussed (1) also the rationale of the treatment as follows: "I have no definite data to advance, but would suggest the following theory: The exchange of substances from the subarachnoid spaces to the blood can be brought about with much greater ease than in the opposite direction, particularly with an increased intraspinal pressure. Assuming chorea to be an infection localized in the cord, we can imagine the possibility of the antigen finding its way into the circulation and thus stimulate the production of antibodies, which cannot find their way back into the spinal fluid and cord by reason of the lower pressure in the circulation and the obstacle offered by the choroid plexus. By introducing the serum of the patient, presumably rich in antibodies, direct into the spinal space we have, analogous to the rationale advanced by Flexner in relation to epidemic cerebrospinal meningitis, the means at hand to combat this infection, which from its mode of onset and general progress appears to be of the subacute or chronic variety."

Looking over the more recent literature I find that Morse and Floyd (2), after a careful review of the literature and subsequent original research of their own come to the conclusion that "their results suggest that a microorganism or a group of microorganisms may be the cause of chorea . . . and tend to confirm the belief that there is an intimate relation between chorea, rheumatism and endocarditis. . . ." They isolated a streptococcus from a case of chorea and state. . . . That the fact that it (the streptococcus obtained from the blood culture) caused lesions in the brain and meninges of rabbits similar to those found in the brain and meninges in fatal cases of chorea suggests that it was also the cause of chorea in the child."

Graves and Paige (3) hold "that it is possible that acute chorea is due to the action of bacterial toxins, perhaps a selective action, upon central nerve cells in persons whose inherited nervous instability makes them more readily subject to such toxic action." Thus answering Osler (4) who offers "the prominent physical element as one of the most serious objections to the conclusions of Morse and Floyd, since there can be no doubt that ordinary chorea may rapidly follow a fright or a sudden emotion," Alfara (5) believes that chorea is the result of the action of bacterial poisons on the basal ganglions, particularly the striate body. Schroeder (6) quotes various authors and investigators in support of the pathology in chorea and meets Cobb's (7) objection to the organic theory on account of attacks following fright and sudden emotion by pointing out that emotional shock may activate an organic lesion which has previously failed to show overt symptoms and summarizes as follows: "Aschoff nodules have been demonstrated in the heart muscle of a twenty months' old child who had chorea and a fulminating rheumatic carditic and pericarditis. Advances in the study of the physiology of the basal ganglions make it seem likely that the chief pathological changes in chorea minor occur there."

In view of these contributions to our knowledge of the pathology of chorea I feel that my theory of the rationale of autoserum treatment is fairly well supported. During the past eight years I have seen and treated fifty-nine cases of chorea minor by the intraspinal serum method. These patients were treated in Fordham and Knickerbocker hospitals in New York city, in private sanatoria, and in the patients' homes and are classified as follows:

Age: youngest, four years; oldest, nineteen; average, eleven and three tenths years. Duration of illness, from day of admission to day of discharge as cured, or improved: shortest period, four days; longest, ninety-six days; average, thirty-two and four tenths days. Previous attacks of chorea: one attack, twenty; two attacks, nine; three attacks or more, two. Total number of cases having previous attacks of chorea, thirty-one. Previous diseases (one or more) of those enumerated below: Tonsillitis, thirty-five; measles, twenty-eight; rheumatism, eight; scarlatina, six; diphtheria, six; mumps, two.

Among the cases treated the following is of special interest:

CASE.—M. K., a boy sixteen years of age, was admitted to Fordham Hospital July 1, 1921. His tonsils and adenoids had been removed a year ago. His older brother, a teacher having charge of backward children, told us that the boy was classified as eight years of age, mentally. He had had several attacks of chorea during the previous two years, was under treatment for it in various institutions, but had not obtained definite relief. An x ray of the head showed that the sella turcica was shallow and the anterior clinoid process atrophic.

After a rest of several days in the hospital intraspinous serum medication was administered and within six days the choreiform movements ceased. In less than two weeks he was allowed to walk around in the ward and later he assisted the nurses in distributing food to the other patients. About two days before his discharge from the hospital on August 22, 1921, he was put on anterior lobe of pituitary gland, one fifth grain, three times a day, and his family physician, Dr. Dreiblatt, who had referred the case to me, was advised to continue this medication for some time.

The young man called on me some time in January, 1924. He had had no recurrence of the chorea, had improved physically and mentally beyond recognition, and was working in an office in a clerical position, giving entire satisfaction.

Among the cases treated there were a number in which the patient's previous history was either not obtainable or very indefinite, since the majority of

*Read at the meeting of the American Therapeutic Society, held in Toronto, Canada, May, 1924.

cases were among children of foreigners whose knowledge of the English language was limited.

We have not been able to check up on all the cases treated, as we were unable to locate the patients. However, in the fifty-nine cases treated only one patient returned to the hospital two and half years after treatment showing choreiform movements, which subsided after a week in the hospital under dietetic care and rest.

CONCLUSIONS

1. Pathological research has fairly well shown that chorea can be considered as of bacterial origin.

2. While a focal source of infection cannot always be demonstrated or elicited from the history a great many patients do give a history of previous infection.

3. The antiserum treatment has been successful in practically all cases and deserves further investigation.

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Etiology and Treatment of Rheumatoid Arthritis and Allied Diseases.—S. G. Billington and Sandison Crabbe (*British Medical Journal,* June 21, 1924) classify the socalled rheumatic conditions according to the usual causes of inflammation: physical (mechanical or traumatic), chemical (metabolic, gouty, diabetic, alcohol, etc.), thermal (heat or cold), specific (syphilitic, neuropathic, hemophilic, and the specific bacterial, such as typhoid, gonococcal, etc.) and nonspecific bacterial. Only the nonspecific bacterial group are considered, though the others must be mentioned from the point of view of differential diagnosis.

Articular rheumatism can be divided into two great groups: 1, rheumatic arthritis, and 2, the rheumatoid group, including the various types of rhaumatoid arthritis and osteoarthritis. Three stages of rheumatoid arthritis can be recognized: 1, early, with slight or recently developed joint lesions; 2, active arthritis with definite arthritis changes; 3, old standing arthritis, with or without the presence of the active disease, but with postarthritis deformities, contractures, muscular atony and wasting.

The treatment includes the following procedures: 1, Removal of the infective focus; 2, neutralization of bacterial toxemia in blood stream and affected tissue; 3, orthopedic treatment of the results of the disease; 4, psychological treatment; 5, general treatment by tonics, endocrine preparations, etc. In the first stage removal of the infective focus is usually all that is necessary. In the second stage the toxemia must be neutralized. The third stage includes: 1, the removal of the infective focus if present; 2, the treatment of the active arthritis if present; 3, the treatment of postarthritis sequelæ by electricity, massage, manipulation, exercises, or operation; 4, the use of a vaccine as a prophylactic against lighting up the disease by the orthopedic procedures; 5, general and psychological attention to the patient.

The diagnosis must be made from diseases of metabolic or chemical origin, such as gout, diabetes, and alcoholism; from mechanical conditions resulting from trauma, occupation, pressure of new growth, etc.; and from displacements, such as flat foot and coxa vara. Syphilitic, neuropathic, and the specific bacterial affections require separate consideration. The diagnosis between active arthritis and postarthritis sequelæ is most important. The three most important evidences of active arthritis are: pain apart from movement, the night pain being the most characteristic; local tenderness; and general debility with often a toxemic facial aspect.

In the first stage all foci of infection should be sought, especially in the teeth, the gallbladder and in the genitourinary system, and also in the intestinal tract (appendix). In the second stage, such drugs as guaiacol carbonate, iodides, collosol manganese, and alternating collosol iodine and collosol sulphur may be used. Peptone or other foreign proteins are of advantage. The most reliable antibacterial agent is an autogenous vaccine. The physiotherapeutic measures include the high candlepower lamp, diathermy, the static brush effleuve, the static wave, the tungsten arc lamp and the galvanic current. The operative measures include wrenching under anesthesia, open operation for removal of osteophytic outgrowths and hypertrophied synovial membrane and excision of the joint. In the psychological aspect, endocrine therapy is useful, using pluriglandular preparations.

Causes and Treatment of Otitis Media.—David T. Smith (*American Journal of Diseases of Children,* July, 1924) states that the mechanical problem in the treatment of otitis media is of vital importance. The pus must be cleaned from the external ear, and the antiseptic introduced into the middle ear where it can act directly on the organisms causing the disease. Ordinary commercial hydrogen peroxide diluted one half with water was found to be the most efficient irrigating fluid. The incision in the tympanic membrane should be long and clean, preferably in the posterior inferior quadrant. After the irrigation is completed, judged by the cessation of the frothing of the peroxide, the excess of fluid in the external auditory canal is swabbed away with cotton. A few drops of the prescribed antiseptic are dropped from a medicine dropper into the external canal. Not a single case of mastoiditis followed the use of hydrogen peroxide.

Practically all the gram negative bacteria found in cases of otitis media, except pyocyaneus bacilli, are killed by a 0.5 per cent. solution of sodium hydroxymercuribenzophenone sulphonate. Pyocyaneus bacilli are readily eliminated by treatment with two per cent. acetic acid, or preferably with 0.5 per cent. of the sodium solution which contains two per cent. acetic acid. All the gram positive bacteria found in otitis media are readily killed by gentian violet except streptococci. Neutral acriflavine has been proved more potent in the treatment of otitis media associated with streptococci, but even this drug is not entirely satisfactory.

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Multiple Gastric Ulcers*

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In considering this report on patients treated for multiple gastric ulcers, it is necessary to keep in mind that the series covers a period of ten years, and that many of the cases incorrectly diagnosed several years ago would be correctly diagnosed now. It is only within the last few years that x ray examinations have reached their present degree of perfection in this type of cases, and it is fair to assume that an expert röntgenologist can now detect the presence of multiple lesions in the stomach and duodenum in a considerable proportion of cases. Years ago, it was believed that in most cases of dyspepsia there was a lesion or disturbance of some kind in the stomach itself, but now, by careful statistical study, it can be shown that dyspepsia is much more often the result of chronic inflammation in the gallbladder than of any other condition.

Along with the progress that has been made in laboratory and clinical methods and interpretations has come the development in our judgment as to the type of operation that is best suited for multiple ulcers of the stomach. We do not believe that radical operations are indicated in all cases, especially if the ulceration is confined to the duodenum. In the particular group being considered here, undoubtedly better ultimate results will be obtained by resection and removal of the ulcer bearing part, and fewer secondary operations would have to be performed. In order to improve the immediate results in gastric surgery, it will be necessary to find some plan by which the pulmonary complications and thromboses can be avoided.

From 1914 to 1924, 1,475 cases of gastric ulcer were operated on in the Mayo Clinic, in 247 of which there was an associated duodenal ulcer. Of the total, there were eighty-seven cases with two or more ulcerations in the stomach, and in twelve of these, a duodenal ulcer was coexistent. Thus in this series there were multiple ulcers in six per cent. Usually the number was two, sometimes three; in only seventeen per cent. were there more than three ulcerations.

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Clinically one is rarely able to diagnose multiple gastric ulcers. One case of this series was so diagnosed from the history, which was unusual, and two other cases, from the x ray findings. Three cases were diagnosed carcinoma of the stomach, chiefly because of the x ray findings; and one case because of the history and findings of an obstruction at the pylorus. A diagnosis was made of duodenal ulcer in ten cases, largely on the basis of the x ray findings. Of the twelve cases in which a duodenal ulcer and multiple gastric ulcers were present, the diagnosis was made in six, entirely because of the x ray report.

The average age of the patients in this series was forty-five years, the youngest patient being twenty-one, and the oldest seventy; seventy per cent. were males.

There does not seem to be anything distinctive in the history or physical examination to lead one to suspect multiple ulcers. The duration of symptoms ranged from five weeks to thirty-two years, the average being nine and two tenths years. One fact may be significant, that in forty-four and eight tenths per cent. of the cases the symptoms at the time of examination were continuous, and had been so for a period of from several weeks to several years, although at the beginning of the trouble, there was ordinarily the periodicity usually found in cases of peptic ulcers. The severity of the symptoms was apparently only average.

Bleeding, as hematemesis or melena, was present in twenty-seven cases (thirty-one per cent.), ranging from coffee ground vomitus to repeated profuse hemorrhages. One patient had had twenty-six more or less severe hemorrhages. Chronic perforation, of greater or less extent, was present in twenty-eight cases (thirty-two per cent). Some of the patients were in poor condition, usually due to pyloric stenosis, and in a few instances to secondary anemia. Six of the cases were syphilitic in origin.

X RAY FINDINGS

In only two cases did the x ray examination reveal definitely two ulcers in the stomach. In two

other cases there was a possibility of a second ulcer being present. Two cases were listed as negative. Five cases were diagnosed duodenal ulcer, but in these the ulcers were at or near the pylorus. Four cases were diagnosed carcinoma of the stomach; two of these were syphilitic. Ten cases were listed as lesions at the pylorus; two as indeterminate; two as prepyloric, and one as a lesion of the stomach. In the remainder of the cases a diagnosis was made of gastric ulcer. Of the twelve cases in which there were both duodenal and gastric ulcers, the diagnosis of gastric and duodenal ulcer was made in six; in five a gastric ulcer alone was noted, and in one, only the duodenal ulcer. It is clear, therefore, that although the x ray findings were positive in more than ninety-five per cent. of the cases, in only four and five tenths per cent. was there evidence tending to show the existence of more than one ulcer in the stomach. In one half the cases of duodenal and gastric ulcers, the existence of the two conditions was noted.

PATHOLOGY

Two ulcers were found in sixty-three per cent. of the cases; three ulcers in twenty per cent. and more than three in seventeen per cent. There was an associated duodenal ulcer in thirteen and seven tenths of the total number. The largest number of ulcerations was twenty-two (Fig. 1).

Fig. 1.—Resected stomach with twenty-two simple ulcerations.

If there were more than three ulcerations, usually only one or two ulcers had a deep crater with rounded, thickened edges, and much induration. The others, though varying considerably in size, usually were smaller, round, punched out, shallow, and apparently more recent. As to the mechanism of their occurrence, and the length of time they had been present, one may only guess. It does not seem too unreasonable to assume that they are infectious in origin, and possibly due to an extension of the infection from the older ulcer or ulcers.

The largest of the ulcers was five cm. in diameter, and the smallest two m.m. The majority were located on the lesser curvature near the pylorus, not infrequently in the pylorus. Others were found in practically any part of the stomach, often on the anterior or posterior walls, and less often on the greater curvature or near the cardia. Adhesions were common, particularly in the thirty-two per cent. of cases in which there was slight perforation.

In one case there was a carcinomatous ulcer four cm. in diameter, and two smaller simple ulcers. In another case there was a small carcinoma eight mm. in diameter, and three simple ulcers. In three cases the gross or microscopic findings suggested malignancy, but a definite diagnosis could not be made. The remainder of the cases, with the exception of those which were syphilitic, were simple gastric ulcers.

CASES OF SYPHILITIC ORIGIN

Five of the cases were undoubtedly syphilitic, and one was questionable only because of the negative Wassermann reaction and general examination, the local findings being typical. In three of the six cases the clinical diagnosis was either certainly or possibly syphilis; in the other three it was not suspected until operation.

The average age of the patients was thirty-five years. The x ray findings were carcinoma of the stomach in two cases; a prepyloric lesion in two; gastric ulcer in one case, and a syphilitic contracture in one.

At operation the picture was often suggestive of syphilis. The affected area of the stomach was found to be hard, and formed a mass, simulating malignancy, and often causing either pyloric obstruction or hourglass contracture. There was much thickening and scar tissue. If the lesion involved the pyloric end of the stomach, it stopped short at the duodenum.

Pathological examination revealed multiple, usually shallow ulcerations, often inflammatory, with markedly thickened, fibrous walls. Microscopically, there was dense lymphocytic infiltration on the mucous surface, as well as perivascular lymphocyte and plasma cell infiltration, and marked perigastritis. There was no evidence of tuberculosis.

There was nothing unusual in the types of operation done in these cases. All the patients received treatment for syphilis before operation. The significant point is that, in three of the cases, the lesion was not suspected of being syphilitic until this was indicated by the operative and pathologic findings, and the diagnosis assured by positive Wassermann reactions. In two cases the findings at operation established the previous suspicion of syphilis. Hence, in cases of multiple gastric ulcers which present the gross characteristics already mentioned, a careful microscopic examination, and an investigation for syphilis should be made, lest this condition be overlooked.

DISCUSSION

Many types of operations were used in this series of cases, including simple gastroenterostomy in the case of several perforating ulcers on the posterior wall of the stomach, pyloroplasty, and other plastic operations in the earlier years, and more recently resection of part of the stomach. Although we may not agree with Finsterer and others in the radical measures for a single ulcer, in the case of multiple

ulcerations a resection, including the entire ulcerated area, seems best. The various operations performed in this series are shown in Table I. It will be noted that some form of resection was performed in considerably more than half the cases.

TABLE I

VARIOUS OPERATIONS USED

	Cases
Anterior Pólya	18
Posterior Pólya	10
Sleeve resection	12
Sleeve resection and pyloroplasty	3
Posterior gastroenterostomy	9
Posterior gastroenterostomy and plastic	1
Anterior gastroenterostomy	2
Billroth No. 1	2
Billroth No. 2	5
Knife excision and gastroenterostomy	9
Knife excision and pyloroplasty	3
Cautery excision or destruction, and gastroenterostomy	7
Cautery excision or destruction, and pyloroplasty	3
Pyloroplasty	3
	87

The results of operation are shown in Table II. Three patients could not be traced, and eleven were operated on too recently to permit the determination of results. The hospital mortality for the series was notably low, three and four tenths per cent., compared with a mortality of four and five tenths per cent. for the total of 1,228 gastric ulcers operated on during the same decade. Of the three deaths, one was due to pneumonia, one to pulmonary embolism, and one to hemorrhage from seven acute ulcers.

TABLE II

RESULTS OF OPERATIONS

	Cases
Excellent	31
Good	19
Fair	6
Poor	1
Failure	3
Recent operations too early for determination of results.	11
Patient died in hospital	3
Good or fair results, but later trouble	7
Not located or traced, or result not known	3
Good, but the patient died in one to three months from accident or otherwise	3
	87

Failures.—The one case in which the results are classified as poor was that of a woman who had had a sleeve resection for marked hourglass deformity. She improved for a very short time, but since then has had a good deal of discomfort. In one of the cases listed as a failure, a carcinomatous ulcer was associated with simple ulcers. Although a Pólya resection was performed, the patient returned to the Clinic in five months with recurrent carcinoma of the stomach, and died soon after.

The second of the failures was a case in which several ulcers on the posterior wall had perforated. A gastroduodenostomy was performed, but the symptoms soon returned and became as severe as before. Subsequently the patient had a severe gastric hemorrhage, and two years later died, the cause not being known.

The third case was one in which an anterior Pólya resection had been performed. The patient reported one and one half years later that he had not obtained relief, that he had the same symptoms as before, and was in poor condition.

Temporary Good Results Followed by Recurrence.—Of the cases in which partial or complete relief was obtained for a variable period, with later gastric symptoms, there were definite recurrences in two. In one, several gastric ulcers had been excised by cautery and a gastroduodenostomy performed. The patient was completely relieved for one year, and then had a recurrence of symptoms. He was again operated on recently, and eight ulcers were found in the stomach. A Billroth 1 reaction was performed. The other case was that of a woman who had had a knife excision of multiple gastric ulcers, combined with a posterior gastroenterostomy. The result was good for a year, then the symptoms returned. On exploration, two gastric ulcers and a gastrojejunal ulcer were found. A posterior Pólya resection was performed, and the patient is now in excellent health.

In the other instances, various factors were responsible for the return of symptoms. One patient had had an anterior gastroenterostomy for ulcers on the lesser curvature and posterior wall. After a year of relief, he developed symptoms of ulcer, and died from acute perforation. It is questionable whether this was a recurrence, or a reactivation of the ulcers, which had not been removed. Another woman had had a plastic operation and posterior gastroenterostomy for an hourglass deformity from a perforating ulcer. After a period of complete relief, she was operated on elsewhere for a recurrence of the hourglass deformity. Still another patient who had had a Billroth 1 resection, and had been relieved for a year, was reoperated on elsewhere for what was said to be an obstruction to the outlet, the cause not being mentioned. Another man who had obtained relief following excision of ulcers, and a plastic operation, returned recently with symptoms of obstruction, and a posterior gastroenterostomy was performed.

The seventh patient returned one and one half years after gastroenterostomy had been performed, and operation revealed chronic obstruction of the proximal loop of jejunum, due to extensive adhesions. These were separated, and one gastric ulcer excised. The results are now reported as excellent.

Iodotherapy of Pernicious Anemia. — Gottfried Holler (*Wiener klinische Wochenschrift,* June 26, 1924) considers pernicious anemia as a hemolytic anemia, in which the hemolysin is formed by the primary disease and the dysfunction of an organ with increased endocrine functions. He, therefore, recommends iodotherapy in pernicious anemia (if possible following a splenectomy) in the following way:

The patients are given three times three to three times five drops of a five per cent. solution of potassium iodide internally for a long time (even for years). It may also be well to administer thyroid gland preparations at the same time for a while. A simultaneous carefully conducted course of arsenic seems also to be of considerable value. He emphasizes the fact that an acute (early) result of the iodotherapy should not be expected, as for this purpose arsenic or, better yet, a transfusion of blood is more serviceable. The value of iodotherapy lies in the lasting effect.

Pyloric Stenosis and Pylorospasm

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These two conditions are separate entities, but resemble each other clinically. Certain cases of stenosis are so mild and so amenable to treatment that they may be classed as spasm unless a definite tumor is found. These conditions are so often unrecognized or thought to be some other condition that it seems appropriate to consider the cases we have seen either in private practice or in the clinic[1] in the past two years, and discuss the outstanding features.

Theories as to etiology are not discussed except to mention that the condition is probably antenatal as evidenced by cases found in prematurely born and stillborn infants. The pyloric muscle begins to develop about the third month of fetal life and the size is proportionate to the age of the infant.

Age.—Usually from the third to sixth week. Our cases of stenosis were eight in number and the age incidence from four weeks to two months, while the cases of spasm were seven in number and the ages ranged from four weeks to three months.

Sex.—Of the stenosis cases there were four females and four males, and of the spasm cases four were males and three females. This shows the condition to be about equally divided.

The figures of Still, who reported 247 cases, showed thirty-seven females and 210 males. Also he reported the majority of his cases as occurring in the firstborn. Our stenosis cases were six first born, one second and one third, and the spasm cases were four first and three second born. No especial notes were made as to parental age, but all were young excepting in one case and the general health was normal.

Histopathology.—Wollstein has studied these cases particularly and found no changes in the mucosa. The changes are limited to the submucosa and circular muscular fibres. There are no inflammatory changes. The vomiting is purely mechanical. The submucosa is edematous and wider than usual. The circular coat is two to three times wider than normal, due to the large amount of muscle tissue. There is no increase in the connective tissue between the cells. The serosa is normal. The average thickness of the circular coat is one and six tenths mm. and the average length of the pylorus one and five tenths cm. In stenosis the average width of the circular coat is four and four tenths mm., while the average length is three cm.

Symptoms.—Certain features stand out prominently and should make one suspect an obstruction of some sort. Vomiting is the first and most pronounced symptom and the one which usually causes the mother to go to the physician. It is essential that a careful history be taken as to the kind of food, the feeding intervals, the length of time at feedings, and whether the vomiting is merely a regurgitation or of a projectile type. Much may be learned from this history. The next step is to strip the child and examine the bared abdomen in a good light. I prefer the light coming from above or from the foot of the patient. If there is an obstruction, even slight, there is a fullness of the upper abdomen, while below the navel it is more flat. If there is food or water in the stomach, it is easy to see peristalsis from the left to the right across the abdomen, just above, or at the level of the umbilicus. The waves are quite characteristic and are not noted in the normal abdomen. If the stomach is empty peristalsis is not noted or only faintly after prolonged watching. The tumor is not always palpable; some assert, however, that all cases of stenosis have a palpable tumor. It may be found more constantly if the condition has gone on for some time. It is high up, just to the right of the midline of the abdomen, and usually behind the edge of the liver. Palpating gently and persistently after food intake and while peristalsis is going on, at the end of a wave you may be able to feel a little knot, not larger than a small olive, and easily overlooked unless you are watching for it. The thinness of the abdomen in these cases, especially where there is emaciation, makes this process easier than in the normal well nourished infant. The stool found in true stenosis is a starvation stool, brownish and thin, while in spasm there is more substance to it. These are the conditions where physics are used so extensively due to a mistaken idea of the treatment of the constipation, which is due not to the inability of the bowels to move, but to the lack of intestinal contents.

DIFFERENTIAL DIAGNOSIS

So far, the two conditions of spasm and stenosis have been considered together, and now come the differential points. It is an easy matter to use barium and the x ray to make diagnosis. In stenosis, the barium does not pass out except in small amounts in the first four hours, the appearance of the stomach being that of a round shadow with no apparent outlet except at the cardia. In spasm, at the end of four hours a large part of the barium has passed through the pylorus and may be seen to pass through intermittently. However, it is not necessary to have the x ray for diagnosis. The therapeutic test is quite satisfactory, although Haas claims that all cases of stenosis are merely advanced stages of spasm and may be treated medically with recovery. This statement is not in accord with our experience and that of others. The experience of Strauss, that the spasm cases do not have that cartilaginous type of tumor which is sharply marked when cut in two, seems also to throw doubt on the theory. We have found that if the infant does not respond promptly to treatment by proper medication and diet, and if x ray is not available, open surgical treatment is necessary. In all our cases of stenosis even though the tumor was not always definitely palpable before operation it was present when the abdomen was opened. The nutrition, in all cases of stenosis seen

[1]Anita M. Baldwin Hospital for Babies.

shortly after the initial vomiting, was fairly good, though there was a gradual loss of weight, which usually was the same as at birth or slightly lower. This was not so marked in the true spasm cases, where there was a slight increase over the birth weight.

PROGNOSIS

Goldbloom and Spence in their studies found that twenty per cent. loss of the highest weight was the maximum that an infant could lose and still recover, with proper surgical interference. The mortality of bottle fed babies is three times that of the breast fed. The mortality is less in cases which have lasted four weeks or less, than in those which have lasted over four weeks. Therefore the earlier the diagnosis and the institution of proper treatment the better the prognosis. If an infant does not respond to medical treatment within seventy-two hours or less from the time it is first seen by us we advise immediate operation.

TREATMENT

This may be divided into two types, medical and surgical. The medical treatment is primarily for spasm cases or mild stenosis cases. We use one to five drops of a one to one thousandth atropine solution made up fresh, and give it one half hour before feedings in one teaspoonful warm water, or one one thousandth grain of atropine hypodermically fifteen minutes before feedings.

If the infant is breast fed we put it to the breast for five minutes and then place it in an upright position so that gases may be expelled easily, and regurgitation may not be induced. If the infant keeps the food down, as is sometimes the case, we continue this treatment. Points that should be emphasized are that no abdominal binder should be on the infant, but everything free to avoid any pressure over the stomach, or epigastrium; that the infant should not be handled for at least two hours after feedings; and the feedings should be four hours apart.

If the liquid diet is not retained after three or four attempts we institute thick cereal feedings. Our formula is as follows: skim milk ten oz., water eleven oz., farina or cream of wheat six to eight level tablespoonfuls and dextrimaltose, three level tablespoonfuls. The larger amount of cereal is used when we use breast milk in addition to cow's milk, making the addition as will be told later. The mixture is cooked for one and one half hours in a double boiler and should be thick enough to stick to the spoon when inverted. This is Sauer's method. When we add breast milk we have the mother express it directly into a sterile container and mix about one ounce of this with three ounces of thick cereal. In this manner, no cooking is done to the breast milk and the food is better. This mixture is fed through a large nipple which has the hole cut about one quarter inch in diameter and is pressed through with a spoon. The material may be kept warm and fairly soft by keeping in a dish of hot water, while feeding. The feeding periods are every four hours.

We have not used the stomach washings before feedings, nor even once a day as some advocate, although it is usually recommended, but we believe that the less handling these patients have and the less irritation of the gastric mucosa by mechanical means the better results are obtained.

If medical treatment is not satisfactory and the food is regurgitated, the time has come when surgery is indicated, particularly if the weight remains stationary or there is a loss, but do not consider surgery a last resort. If the patient presents the typical findings when first seen, do not wait to try medical treatment and lose time but operate as a life saving procedure. If the case is not appropriate for medical care and the technic correct, results are satisfactory. Our surgeons use the Rammstedt modification of the Fredet method. There is no other method to be considered. Our mortality was one case which was moribund at the time of operation. We wash the stomach out before operation. Ether anesthesia is used and just before closing the abdomen thirty c.c. of normal salt solution is placed in the peritoneal cavity. The patients are kept warm, quiet, and nothing given by mouth until two hours postoperative. Then one dram of water is given every hour until the sixth hour, then one dram of mother's milk and one dram of water every two hours for twenty-four hours. At the end of twenty-four hours, if there is no vomiting, we give two to four drams of mother's milk undiluted every three hours and at the end of forty-eight hours, one ounce of mother's milk every three hours, with water between. By the third day we give full feedings provided there is no vomiting. Where the mother is nursing, she holds the infant on a pillow and feeds directly at the breast. The stitches are removed on the seventh day and the infant sent home on the tenth.

The following case histories will illustrate some of these points:

STENOSIS

Case I.—D., August 29, 1922. Consultation with Dr. Bewley. Age five weeks, female. Vomiting since birth which had become more intense. Stools were green and constipated. The patient was extremely emaciated and dehydrated. Peristalsis was visible. Thick cereal feedings were advised, also atropine solution. At the end of twenty-four hours, the child was removed to the hospital and 160 c.c. of normal salt solution given intraperitoneally. The thick feedings were retained. On August 31st, it was considered advisable to operate. While on the operating table the child was given five per cent. glucose, ten c.c. intramuscularly and ten c.c. subcutaneously. It was put to bed in good condition. The child made an uneventful recovery and was discharged at the end of a week.

Case II.—March 18, 1922. L., a female, was brought in from Lancaster, at the age of two months. Birth weight ten pounds. Had vomited for two weeks. The child was the youngest of three. Had had a normal delivery. The first child was still born. Never had breast feedings because the mother was advised not to nurse it as she was told that she had tuberculosis. The baby had been fed on Eagle Brand condensed milk and weighed ten pounds. The heart and lungs were normal. There was visible peristalsis from left to right with palpable tumor in upper right quadrant; marked dehydration, stools green and constipated, no blood. A simple dryco mixture was tried but regurgitated. On the 19th,

the child was removed to the hospital. Barium mixture was given, but little passed through the pylorus. At operation the child was in only fair condition. The postoperative vomiting persisted in spite of stomach washings and atropine solution. On March 25th, the abdominal sutures broke and the wound opened. It was closed quickly, but vomiting persisted and the patient died March 29th, of acute peritonitis. Autopsy showed a small perforation at the duodenal end of the incision and slight peritonitis. This was the only death we had.

CASE III.—K., male, referred by Dr. Flint on November 16, 1922, at the age of six and one half weeks. The baby started vomiting three weeks before. This was of the projectile type, after nearly every feeding and if he held one meal down it would be expelled at the next feeding. Sometimes this vomiting occurred as soon as feeding had finished.

This was a first child. The labor lasted forty-eight hours, instrumental delivery. Birth weight was six pounds. Breast fed every two and one half hours. Stools at first were yellow, but had been green for three weeks and extremely constipated. The heart and lungs were negative. Skin was in fair condition, no dehydration. Abdomen showed visible peristalsis from left to right; no tumor was palpable. Atropine solution was given but vomiting persisted. The patient was operated on November 17th, and on November 29th the weight was seven pounds ten and one half ounces. He was getting breast feedings right along. On March 12, 1923, the weight was thirteen pounds eight ounces.

CASE IV.—E. T., October 17, 1922. Consultation with Dr. Armstrong. There had been projectile vomiting for three days, with constipated green stools. The patient was a female, aged four weeks. A first child, and had had a normal delivery. The mother was asthmatic. The birth weight was six pounds six ounces.

The present weight was five pounds fifteen ounces. Nutrition fair, good tissue turgor, some depression of anterior fontanelle. The heart and lungs were negative. There was visible peristalsis from left to right, but no definite tumor mass palpable, projectile vomiting. Atropine solution was advised for twenty-four hours and a continuance of breast feedings. After forty-eight hours because of persistent vomiting and weight loss an operation was performed. Breast feedings were continued and the case dismissed October 28th. November 9th, three weeks after operation, the weight was seven pounds one ounce and the patient was doing well. Since then the condition of the child has progressed normally.

PYLOROSPASM

CASE I.—W. T., December 30, 1921. Male, age three months, normal delivery, second child, breast fed one month, then on modified cow's milk. Birth weight eight pounds. The complaint was colic and vomiting.

Examination: The chest findings were negative. There was visible gastric peristalsis. The weight was ten pounds. The stools were constipated.

On January 1, 1922, atropine solution was begun, the liquid formula being continued, but the vomiting persisted so the child was put on a thick cereal mixture plus atropine. The stools became better, but a dermatitis developed, probably from the excess starch in the feedings. He vomited water or any liquid for over a month after starting treatment. Recovery finally ensued. No x rays were taken.

CASE II.—F. B., January 9, 1922. The complaint was "spitting up." The patient was a male, aged two months. Birth weight eight pounds eight ounces. Was on breast feedings up to January 1st, and gained up to ten pounds two ounces. On account of mastitis in the mother, the child was weaned and on January 9th the weight was down to nine pounds four ounces. The stools were a pasty yellow. There was some spitting up. He was put on a wheat flour and water mixture. On January 14th the weight was nine pounds fifteen ounces. The vomiting had become persistent and the stools were constipated. It was advised to continue the same feeding, but on January 19th it was necessary to give thick cereal feedings and atropine solution. Visible peristalsis was not present and no x rays were taken, the only symptom being the persistent projectile vomiting. This food was retained and we gradually cut it down and increased the milk and water mixture. On December 18, 1922, his weight was twenty-six pounds fourteen ounces. There was always a question as to whether this was a true pyloroplasm, but clinically it resembled these cases in many ways. There was undoubtedly a neurotic basis back of the vomiting in this case as in spasm.

CASE III.—Baby R. K., July, 1922. There had been persistent vomiting, colic, brownish stool, somewhat foamy. Duration seventy-two hours. The patient was a female, first child, aged five weeks (referred by Dr. Guidinger of San Pedro). The child was well nourished, temperature 98.6°, heart and lungs were negative. She had on a tight abdominal binder because of a small umbilical hernia. Visible gastric peristalsis was noted. Removing the binder and the use of atropine relieved the vomiting. This baby might easily have been weaned if no history had been taken, and is reported here especially for this purpose.

The mother was neurotic. The tight abdominal binder and probably an increased tension of the infant's nerves, might in the end have been one of the factors back of pylorospasm. This child was seen when she was one year and two weeks old and was found to weigh only fifteen pounds, and was nursed up to her first birthday. She was still high strung and the probabilities are she will later be a subject for the gastroenterologist, as every time she has a little infection or cuts a tooth, she has a marked digestive upset.

CASE IV.—T., September 27, 1922. There had been projectile vomiting for a week. The patient was a male, aged four weeks, second child, normal delivery, breast fed until two days before we saw him. Because of persistent vomiting the baby was put on modified cow's milk. The birth weight was unknown.

The patient was well nourished. It was not weighed this day as there were no scales at the home. The chest was negative. The abdomen showed visible gastric peristalsis after taking food, but no tumor palpable. The stool was greenish yellow with

mucus. Atropine solution was ordered, one half hour before every feeding. On September 30th his weight was nine pounds six ounces, although vomiting persisted. Fluoroscopic examination and plates showed a normal sized stomach which emptied intermittently, apparently a spasm, as in three hours and one half, part of the meal was still in the stomach. The atropine solution and breast feedings were continued. On October 13, 1922, the mother reported by letter, "Glad to say baby is fine and hasn't spit up any since at your office. Haven't given any drops for over one week and is gaining right along." Recovery followed.

CONCLUSIONS

1. There are two definite conditions, spasm and stenosis.
2. Spasm is apparently a nervous condition, while stenosis is a true hypertrophy.
3. It may be and probably is possible to have both conditions together.
4. Spasm is strictly a medical condition, while stenosis is surgical.
5. The Fredt-Rammstedt procedure is the operation of choice.
6. Atropine solution and the thick cereal mixture are specific in the spasm cases.
7. Do not delay operation in stenosis cases where there is marked dehydration, longer than necessary to get fluid into the peritoneal cavity and have some absorbed.
8. Do not wean the baby because it is vomiting mother's milk, but strip it and examine the abdomen. Palpate for a tumor at the pylorus.
9. Do not physic the infant for constipation, especially when vomiting, until you have examined the naked abdomen.

Perforated, Intrathoracic, Hourglass Stomach (Eventration)*

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The case about to be reported is unique in that it presents a combination of a perforated ulcer in an hourglass stomach with an eventration of the diaphragm, the latter condition, of itself, being of sufficient rarity as to be noteworthy.

Eventration of the diaphragm is an abnormal elevation of one side of the diaphragm, without break in continuity of structure. Only about one hundred and twenty cases are on record but, since I am shortly to publish a quite complete paper on the subject with report of seven cases, the present report will deal more with the treatment of the ulcer under such difficulties as were presented.

CASE REPORT

CASE.—Mr. A. W., aged forty-five, a merchant, was referred by Dr. Sam Maphis, of Warrenton, Va., October 19, 1923. The patient's mother and several brothers and sisters had stomach trouble but otherwise his family history was negative. His health had been excellent all his life except for constipation, which started when a young man, and periodical stomach attacks for twenty or twenty-five years. These periodical upsets were rather typically those of peptic ulcer as there would be pain in the epigastrium about an hour after meals, relieved by soda. He had not tried the effect of food. Bloating and fullness accompanied the pain. Six years previously he had a severe gastric hemorrhage and after recovering from the shock a posterior gastroenterostomy had been performed. The surgeon made no note of any abnormality of the diaphragm or position of the stomach at the time.

He stated he had derived no real benefit from the operation, except that there had been no recurrence of the hemorrhage, and that his recurrent dyspepsia occurred just the same. About a year before he had a sudden attack of severe pain in the epigastrium and left lower chest, necessitating the use of morphine for several days. This was diagnosed as pleurisy by a gastroenterologist, but looking backward with the light gained by future study, I am convinced that this was a pinhole perforation which was shortly sealed up.

During the last six months he had been experiencing more and more trouble with his stomach. Pain had become more and more continuous and soda had lost some of its power of relief. Three days before our examination he took a rather strong laxative to relieve constipation of several days. Shortly thereafter he began to vomit and retched terribly. This gave him a feeling as if something had torn loose in the upper left abdomen and was followed by agonizing pain in the upper abdomen, necessitating large amounts of morphine for the three days before he came for examination. Pain was steady and severe but not colicky in character.

The patient was healthy looking and well built. The skin was flushed. The tongue was dry and moderately coated. Pulse was 100 and temperature was slightly elevated but otherwise examination was negative. There was no localized tenderness and no rigidity. Hemoglobin was 86 per cent. and leucocytes 18,600. Uranalysis and testmeal analysis were both normal.

On fluoroscopic examination I was amazed to see the stomach in the chest opposite the heart so he was sent to Christie, Groover and Merritt for a complete fluoroscopic and film examination. The first was done at their office and he was then taken to Garfield Memorial Hospital, put to bed, and the examination completed there.

Examination of the chest showed no evidence of the presence of disease of the lungs. The heart and great vessels appeared normal in size and position.

*Read before the Medical Society of the District of Columbia, May 21, 1924.

There was marked eventration of the diaphragm on the left side; the diaphragm extended up to the level of the third rib in front and the seventh rib behind. Both the splenic flexure of the colon and the fundus of the stomach were high up against the dome of the diaphragm. There was a distinct hourglass condition of the stomach with a six hour residue in the upper loculus. The entire pyloric half of the stomach showed extensive deformity. The gastroenterostomy showed well and appeared to be functioning. There were a number of very small circular shadows between the stomach and the spine at the site of the hourglass. They were possibly particles of barium in a large accessory pocket. The röntgen diagnosis pointed definitely to the presence of an extensive organic lesion of the stomach, probably a perforated ulcer, with extensive adhesions.

It was evident that he had to be operated upon for the subacute perforation which might become unsealed again at any time, particularly since he was rather difficult to manage. The position of the stomach was so high in the chest (Fig. 1), that it was problematical as to what could be done. It explained the absence of tenderness in the abdomen and the absence of rigidity since the general peritoneal cavity had evidently not been soiled before adhesions sealed the opening.

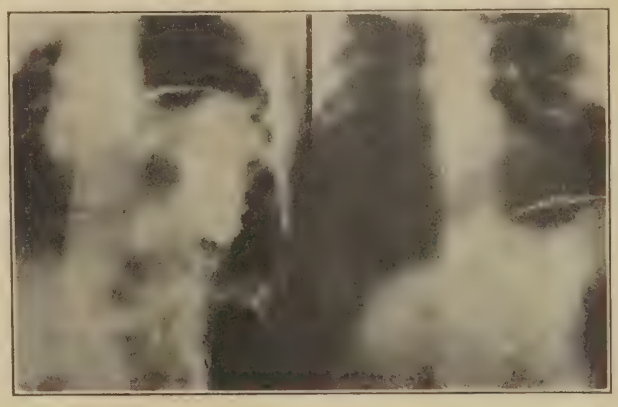

FIG. 1. FIG. 2.

FIG. 1.—Before operation. Note upper sac of hourglass opposite heart shadow with nearly complete obstruction. Line of diaphragm retouched.

FIG. 2.—Four months after operation. Note disappearance of hourglass with perfect functioning through the old gastrojejunostomy. Diaphragm several inches lower. Line of diaphragm retouched.

The abdomen was opened through a left rectus incision, October 23, 1923, with L. H. Reichelderfer and E. L. Morgan assisting. There was little muscle and poor differentiation of the abdominal layers which were all more or less fused, probably from his old operation as the incision was only three fourths inch from the scar. The omentum was adherent to the anterior abdominal wall. Adhesions were divided so that good exposure was finally obtained, the incision reaching to the xyphoid.

When the abdomen was opened the left diaphragm became convex, from below, instead of concave and flopped downward. It was of a pale grey color like a piece of wet blue blotting paper, thin and with apparently no tone whatever, as each respiration caused it to flap back and forth with a perceptible noise. Examination showed no rent in the diaphragm so that the condition was one of eventration and not hernia, although the part about the esophageal opening could be invaginated with the weakest spot about one and a half inches in diameter with a distinct ring about the circumference.

Adhesions from the left lobe of the liver to the diaphragm and stomach had first to be divided. Then the stomach which was adherent to the diaphragm was gradually freed to such an extent that it could be brought several inches lower. Even then the position was high under the ribs. On the posterior wall and lesser curvature, quite near the cardia was a large adherent mass consisting of indurated ulcer and inflammatory tissue walling in the perforation. It felt but did not look like a malignant growth.

A distinct hourglass contraction, as shown by the radiographs, was present at the site of the ulcer, but on the anterior surface of the stomach there was a bridge of healthy uninvolved tissue. The old gastroenterostomy was perfectly normal but being in the lower sac it was useless.

It was manifestly impossible to do a resection of any kind with any prospect of being able to close the opening. A gastrogastrostomy could not easily be done and even an attempt at cautery destruction was not thought advisable because of the extreme inaccessibility of the lesion. The perforated area was whipped over and infolded as much as possible and then covered with omentum. Because of the little strip of healthy tissue on the anterior surface and the knowledge that much of organic obstruction is due to edema and spasm resultant from the inflammatory process, it was decided that the safest thing to do would be to let the closure of the perforation and the change in position of the stomach, which had been accomplished, suffice and to hope that strict medical treatment would remove at least a part of the hourglass. The abdomen was closed and the patient left the table in good condition.

There were no postoperative complications. He was kept in a semiupright position continuously from the time of the operation to get what benefit could be obtained from gravity. A strict medical cure for ulcer was instituted and kept up for three weeks after which time he was allowed to get up but was placed indefinitely on a soft, selected diet, with alkalies fifteen minutes and an hour after each feeding, and small inbetween meals consisting of milk or crackers.

The wisdom of the conservatism in the treatment of this case is shown by the fact that fluoroscopic examination on discharge from the hospital showed a beautiful wide opening where the hourglass had been and food was passing freely to the gastroenterostomy opening which was functioning perfectly. The patient since that time has had some pain on several occasions but the result may be said to be good.

An x ray examination, which was made four months later (Fig. 2), showed that no marked hourglass stomach and no obstruction were present, but the most gratifying feature was that the diaphragm was about four inches lower than it was before the operation was performed.

THE ROCHAMBEAU.

A Phase of Hernia Too Little Emphasized

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That an oblique inguinal hernia which is just appearing through the internal inguinal ring may cause pain is a fact too seldom recorded in writings on the subject of hernia. Likewise, this fact is not stressed frequently nor emphatically enough in teaching the subject. It is, nevertheless, of considerable importance, especially because the symptoms of such a hernia may simulate those of chronic appendicitis.

Now, in the abundant literature dealing with the number of mistakes in diagnosis of chronic appendicitis for which appendectomies have been done the rate of failure is set as high as from thirty to sixty. These failures are a constant source of chagrin to both surgeon and physician, and consequently, writings are not lacking in explanations and in pleas for more careful examination of the patient.

Many other, better diagnoses have, from time to time, been suggested as possibilities and have been thoroughly discussed except one—oblique inguinal hernia. This condition, while receiving mention now and then it is true, has not been discussed as thoroughly as is warranted by its importance.

The pain or discomfort of a beginning oblique inguinal hernia is usually located over the internal ring. This pain is frequently increased by any movement of the trunk on the pelvis or by coughing; while it is usually relieved by lying on the back. There may be nausea due, apparently, to a reflex stimulation from the knuckle of intestine or peritoneum which is caught in the ring. In an uncomplicated case there are no other symptoms.

In all cases of suspected beginning oblique inguinal hernia, the patient should be examined in the erect posture. The area over the internal ring should be carefully inspected and palpated while the patient is coughing as well as during quiet respiration. A slight bulge may sometimes be made out over the internal ring in slender patients while they are coughing. This finding, however, is rare. The most common finding is to have the patient say that the pain from coughing does not develop when the thumb is held firmly on the skin over the internal ring, which, together with the history of pain in the local area, is sufficient evidence upon which to base a diagnosis of hernia.

When this hernia is on the right side the symptoms may and frequently do simulate a chronic appendicitis thus unfortunately too often leading to an incorrect diagnosis.

Considering the matter in this light, even more operations for chronic appendicitis are uncalled for, doubtless, than writers on the subject have hitherto suspected. Also there are doubtless too many unfortunate patients who continue to suffer but are suspected of being hypochondriacs once the appendix is out and further examination fails to elicit the true cause of the trouble.

In every case of socalled chronic appendicitis, therefore, a careful history should be taken and examination made with special reference to the exact location of the pain, in order to eliminate the possibility that the trouble is at the internal inguinal ring. Likewise, in every case of lower quadrant pain or discomfort which cannot be satisfactorily explained by some other pathology, a beginning hernia should be excluded.

It should also be borne in mind that the hernia may remain at the internal ring, causing pain or discomfort for many weeks or perhaps months, as in the first case cited below.

The Torek (1) method of repair would seem to be the method of choice in dealing with a beginning oblique inguinal hernia in the male. Any other good method is satisfactory in the female as a consideration of the anatomical difference in the contents of the inguinal canal will readily show. Unless the vas and vessels are separated, according to the Torek method, a small hernia may be entirely overlooked, for it has been found that all of these herniae appear at the internal ring within the substance of the cord between the vessels above and the vas below (1). It seems in fact that only by obliterating the potential opening between the vas and vessels can a small hernia be cured. This is accomplished by suturing the internal oblique and transversalis muscles and transversalis fascia to Poupart's ligament with two or more number two chromic catgut sutures placed between the vas and vessels to keep them apart.

Case I.—J. K., a man, married, a piano polisher, thirty-three years of age, of Irish extraction. He complained of slight pain and discomfort in the right lower quadrant of the abdomen especially when he bent forward or lifted heavy objects. This was first noticed about fourteen months before his admission to the hospital. The pain was apparently relieved on lying down. A supposedly thorough examination was made, including an x ray series of the gastrointestinal and urinary tracts; the patient was also cystoscoped and the ureters catheterized. No cause was found for the pain.

In consideration of a history of many previous hospital admissions he was suspected of being a hypochondriac and finally discharged from the hospital. Just before he was ready to leave for home a palpable oblique inguinal hernia developed. This was repaired by the Torek method. One year later the patient reported that there had been no recurrence of the pain or discomfort.

Case II.—I. N., a woman, single, a factory worker, eighteen years of age. She complained of a dull ache in the right lower quadrant of the abdomen. This was first noticed about two months before her admission to the hospital. She suffered pain when she stood but not when she lay down. There was neither nausea nor vomiting, nor were there urinary symptoms. The bowels were regular. Physical examination showed that the pain was localized over the internal inguinal ring on the right side. This pain was most severe when the patient was standing

or when she coughed. If, however, the thumb was held firmly over the internal ring coughing caused no pain. An oblique inguinal hernia was the diagnosis in this case and proved at operation by finding a small hernia at the internal ring. One year later the patient reported that there had been no recurrence of the pain.

SUMMARY AND CONCLUSIONS

1. It is suggested that some cases diagnosed as chronic appendicitis and especially those which are not benefited by appendectomy may be cases of beginning oblique inguinal hernia.

2. Sufficient emphasis has not been placed hitherto upon the symptom of pain or discomfort in the diagnosis of beginning oblique inguinal hernia. This pathology should be excluded in all cases of lower abdominal pain not readily explained on some other basis.

3. A thorough history and great care in physical examination is often necessary to establish a diagnosis of beginning oblique inguinal hernia.

4. The Torek method of repair is advocated in cases of oblique inguinal hernia in males.

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5 ANDERSON STREET.

Hypopancreorrhea (Hypopancrehea)*

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In diagnosing disease of the liver and pancreas many difficulties are met with. This is particularly true of the pancreas. This important gland is sufficiently remote to shield it from examination, but not from injury, and its secretion is poured into such an inaccessible region of the alimentary canal that for a long time the study has been a puzzle to the physiologist and baffling to the physician. In the middle of the last century Sir Thomas Watson in his lectures expressed the following opinion: "It may seem a slight to the pancreas to pass it over without noticing the diseases to which it is subject but really these diseases appear to be but few; and they do not signify their existence by any plain or intelligible signs." Many of the premier men of medicine since then have expressed practically the same view. There are today others who hold to a more optimistic viewpoint which, nevertheless, may still be expressed in the words of Wardell who in 1871 wrote: "No symptoms are pathognomonic of pancreatic disease; an assemblage of symptoms indicates the probability of its lesion."

It is true that we have learned to recognize in fat necrosis a sign indicative of certain lesions of the gland; but this is only manifest with the abdomen opened and lends us no help at the bedside. One other sign has been claimed as significant since Kunzmann's work of a hundred years ago, namely true steatorrhea. It must be apparent, however, to anyone who has had sufficient experience in the origin of obscure abdominal troubles that if we keep the pancreas in mind only disorders of this organ can explain some of the cases that are seen.

Hypopancreorrheic states may be classified as far as our limited knowledge has gone as follows:

FUNCTIONAL

Severe emotional depression (transitory)
Marked adynamic disease
Reflex from cholelithiasis
Congestion from cholelithiasis
Arteriosclerosis
Pressure of large cysts
Causes unknown

PRIMARY ORGANIC

Chronic intralobular pancreatitis
Combined intralobular and interlobular pancreatitis
Hemochromatosis (diabetes mellitus) bronzed diabetes
Congestion of head of the pancreas causing sclerosis
Acute and subacute pancreatitis
Abscess of pancreas
Multiple cysts
Fatty and hypertrophic degeneration (islands of Langerhans) diabetes
Hyaline degeneration of whole gland

SECONDARY ORGANIC

Carcinoma of the pancreas (head)
Syphilis of the pancreas (head)
Tuberculosis of the pancreas (head)
Chronic duodenitis (ascending infection)
Chronic infectious galltract disease
Sarcoma of the pancreas
Cirrhosis of liver
Addison's disease
Obstruction of duct of Wirsung
Pancreatic calculi (multiple)
Achylia

In an able lecture on the subject in 1920 Sir Archibald Garrod presented the indications at our disposal to fall into three main groups as follows:

PANCREATIC SIGNS AND TESTS

Physical Signs and Symbols	*Defects of External Secretion*	*Defects of Internal Secretion*
Aspect	Steatorrhoea	Glycosuria
Tumor	Fatty stools	Lowered sugar tolerance
Pain	Creatorrhea	Cammidge's tests
Tenderness	Impaired casein digestion	
Cyanosis		
Vomiting		
Constipation	Duodenal sound	
Diarrhea	Einhorn's method	
Jaundice	Oil breakfast	
Sympathetic signs	Sahli's capsules	
Ocular signs	Schmidt's test	
Loewi's test	Kashiwado's nuclear test	
	Sajodin test	
	Diastase test, in urine and feces	

To these he added certain syndromes which clinical and pathological experience have taught us to asso-

*Read before the West End Medical Society, October 25, 1924, the New York Polyclinic Medical Society, December 1, 1924, and the People's Hospital Medical Society, December 10, 1924.

ciate with lesions of the pancreas. For instance, the diagnosis of carcinoma of the head of the gland is often correctly made upon clinical evidence and in instances of bronzed diabetes with enlarged cirrhotic liver and peculiar pigmentation of the skin, the pancreas is always implicated.

The physical signs and symptoms of pancreatic disease are best seen in cases of acute pancreatitis, although the large cysts which occasionally spring from the pancreas produce the more conspicuous swellings and it is with carcinoma that the pressure signs are most manifest. The purpose of this article is not to deal with the diagnosis of acute pancreatitis, difficult though it often is, but rather to present data on the still more difficult diagnosis, namely, that of the more chronic cases. In these the tumor of the grossly enlarged pancreas in the upper abdomen and differentiation between the chronic form of trouble and intestinal obstruction never arise. Still there are instances of acute disorder of the pancreas in which recovery ensues without any special treatment, surgical or medical, and in which the factor of continuous or paroxysmal pain and quite alarming symptoms closely approximate those present in acute hemorrhagic pancreatitis. In these the characteristic back pains and even some degree of vomiting may exist. Perhaps one is called upon to make no more difficult conclusion than in these obscure acute cases of recoverable pancreatic disorders and that of hemorrhagic necrosis that justify a fatal prognosis. The best of opinion here is wrapped in doubt and a few hours' observation of the case is essential for any degree of wise conclusion. Whether these belong to the type designated by Curtin as catarrhal pancreatitis with viscid contents in the larger ducts, desquamated columnar cells and the acini considerably dilated, or are forms of ascending infections of low degree, is hard to decree at this time. Certainly some of them, even though there are no products of inflammation, such as leucocytes or fibrin, will go on to abscess formation. Of value here is the history of a cholelithiasis which may help one in prompt decision of surgery. But in the absence of these, the marked symptoms of pain not being relieved by opiates, cyanosis, vomiting and those that simulate intestinal obstruction, may warrant conservatism.

Chronic pancreatitis and deficient states of pancreatic function, the main subject of this article, up to quite recently was difficult to recognize during life. One of the main reasons for this was the fact that as far as we were able to judge from symptoms, or rather from the absence of them, and any of the tests, nothing was definite. In many instances a considerable portion of the parenchyma is undestroyed and the gland is capable of functioning sufficiently without symptoms of any disturbance of digestion or glycosuria. What makes it still more difficult is that many of these instances follow or accompany grave disturbances of the stomach, duodenum or bile passages in which the symptoms of the primary disorder predominate and hinder recognition of the pancreatic disorder.

Among those that may be worked out from study of the acute cases and a few of those of frank pancreatitis are pain in the epigastric region, perhaps between the scapulæ or in the upper dorsal. This may be acute, continuous or paroxysmal or may be of the dull and long continued type.

Of the pressure symptoms of jaundice (noticed in its extreme degree in carcinoma of the head of the pancreas) with acholic stools and characteristic urine none is more conspicuous. One may safely believe with Osler and Sir Mayo Robson that jaundice may be present in the chronic case perhaps not steadily and only slight and transitory coming on from swelling of the head of the gland. One can prove this best in mumps in which a metastasis in the organ occurs. Should it be present the pancreas at the time would be edematous, congested and of a reddish gray tint.

Vomiting is one of the more characteristic symptoms but it is seldom easy to discern whether this is due to trouble in the pancreas or to lesion of the surrounding organs. In a considerable number of instances of chronic dysfunction, from any cause whatever, seen by me the vomiting is of a mild grade, only present at times, and often not much, if any, significance is attached to it. Ill defined and non-ascribable nausea, more prominent even as a symptom than vomiting, deserves mention in this connection.

In the frank cases of chronic pancreatitis no more significant symptom exists than progressive slow loss of weight, especially if this is accompanied with gastric symptoms for which no cause can be gleaned. When in such instances a Cammidge reaction, unabsorbed fecal fat, the Loewi adrenalin mydriasis test, and less than two units exist in the test recently advanced by me (American Medical Association meeting, June, 1924, and to be published in the *Archives of Internal Medicine*) the diagnosis of advanced chronic pancreatitis is warranted.

There is a close connection, as Mayo Robson has shown, between gallstone troubles and interstitial pancreatitis in which the infection of one duct is likely to spread to the other.

Pressure effects (noticed in slow gastric evacuation) in addition to those of the bile ducts may be seen in obstructive symptoms produced by the head of the gland pressing on the duodenum directly or encircling it.

In 1912 Cohn and Pliser called attention to the presence in some cases of pancreatitis of the ocular symptoms associated with excess thyroid activity and reported in five cases that ophthalmos was present in four, VonGraefe's in four, Moebius and Stellwag's in all five and tremor and dermatography in all. If these are present with certain suggestive others they may be of value but in themselves they are not significant.

The clinical test of Loewi's is occasionally of help. This consists of two or three drops of freshly prepared adrenalin solution, one to one thousand dropped into the conjunctival sac and repeated after five minutes. In most all normal people and in many with pancreatic deficiency no dilatation of the pupil occurs in the course of half an hour or an hour. In a few, however, there is conspicuous dilatation, usually excentric in position and often conspicuously oval in form. This test is simple to perform and since it is so often present in exophthalmic goitre (one in three cases) and diabetes (ten out of eighteen cases) it probably is dependent upon irritability of

the sympathetic due to gland imbalance. It has been employed by me often enough in pancreatic disorders of chronic types to make me recommend it as a routine but not to depend upon it alone. It is only a link in the chain of evidence pointing to such a condition and may not be seen in the later stages of the disorder when the play between the two glands ceases to exist.

There now remains the most important of all methods of examination, the indications of abeyance of the external secretion of the pancreas, for upon these alone diagnosis must at most times be based. The pancreas takes a prominent rôle in the digestion of proteins, fats and carbohydrates. When true steatorrhea up to forty or fifty per cent. of dried feces exists, even in the presence of jaundice, it is strongly suggestive of a pancreatic lesion. That steatorrhea may exist as an inborn error of digestion of fats when a full degree of health exists there is no doubt. Garrod reports such a case in a young boy and I have seen three in young adults, the fat percentage being twenty-seven, thirty-six and forty-one and all with normal muscle fibre tests. But what must be remembered here is that fat splitting in digestion may take place normally so far as stool examinations show and still the pancreas may be definitely in dysfunction, and also that there are more factors than lipase in fat digestion. Fatty stools may occur where the alkalinity of the fluids poured into the duodenum are deficient, where there is disturbance of the reversibility action of this enzyme, where resorptive errors exist in the fat lacteals in the villi and where food is hustled too quickly through the small intestine for any cause. While many hold to this test as of negative and positive service, in my hands the factor of error especially in the more moderate grades of dysfunction makes it of questionable clinical value except when there are other distinct symptoms of pancreatic disorder.

Not many worth while observations have been made on proteins. Creatorrhea is of value when marked and there are other symptoms, but there may be no striped muscle fibres present in the stools, the Gross test on casein, the Sahli excretion of iodine or Kashwado's of stained nuclei of calf's thymus may all be negative and yet marked disease may be present. All of these, as well as other messenger tests are of doubtful value especially when in marked disorder of the gland a Kjeldahl estimation may also be negative. When one realizes that trypsin is activated by enterokinase, a secretion of the duodenum, and that there may be a chronic duodenitis in which the enterokinase secretion is deficient although the trypsinogen is abundant, and considers the tryptic properties of the nitrofying bacteria in the intestinal canal it must be evident that no uniform value can come from such tests. This has happened so often in my examinations of cases of definite pancreatic disease that my belief is they are not worthy of continuance.

It may be mentioned here that a procedure that is difficult to perform, time consuming, expensive and possessing the possibility of errors (since all of the physiological matters in the interactions of enzymes are not taken into consideration) such as that of McClure's may be of value in examinations. Where they can be done by competent workers added significance can be gleaned from them.

There now is left the test for carbohydrates or amylopsin, the only enzyme in pancreatic juice that acts directly on starches without assistance from any other agent. For this I would recommend the test recently advanced by me which can be carried out easily and inexpensively as a routine but in the conduction of it I desire to report that after recent studies of the ion concentration best for pancreatic digestion plain water should be employed instead of the suggested buffer solution.

Finally it is my desire to state that there are far more cases of pancreatic dysfunction responsible for digestive symptoms and deficient states of health than has been believed existed heretofore. Some of these are in diabetics in which the islands of Langerhans become finally involved in a chronic pancreatitis. It is my opinion now that loss of weight and strength in diabetes often is due as much to deficiency of external secretion of the pancreas as of internal. All of the instances of gallbladder disease should be carefully examined in pancreatic function and no time should be lost in medical treatment where hypofunction of this gland exists but prompt operation engaged in to eliminate the danger of irreparable harm to the pancreas. Often a gland will work itself up to a higher ability when a diseased gallbladder has been removed. Especially is this true in those instances where at operation a hardened or firmer than normal head of the pancreas is present. When after such operations symptoms of indigestion do not subside or return in a short time and irreparable harm had already been done to the pancreas and postoperative adhesions, return of gallstones, hepatic stones or infections of the hepatic ducts need not be offered as an explanation. Other than the attacks of gallstone colic and jaundice, every symptom of a cholelithiasis case can be and commonly is simulated by chronic pancreatitis alone. If only congestion or low grade infection of the head of the pancreas exists cholecystectomy will restore the function of the pancreas, but once chronic interpancreatitis or intrapancreatitis exists the removal of the gallbladder may do but little good and that's the reason why practically fifty per cent. of the cases of so-called strawberry gallbladders and other forms of low grade infections of the bile sac return with the same spmptoms of indigestion after cholectomy. Another reason is that gallbladders are removed when the symptoms in the first place were pancreatic in origin and the gallbladder figured insignificantly in their production. It should be a routine examination among surgeons to test the pancreatic activity of gallbladder cases before operation, particularly those that are suspected to be without stones, and it would always be wise to remove the gallbladder when the head of the pancreas is firmer than normal irrespective of what the external appearance of the gallbladder is. Only by this routine can a large proportion of these people be saved from intractable and difficult to control digestive symptoms due to hypofunction of the pancreas. The same may be said about the gallbladder in some instances of diabetes, although they are in the minority of all cases; ulcers of stomach and duodenum that are attached to pancreas; and stones in gland ducts.

Lastly, it should be remarked that medical men should consider hypopancreorrhea, regardless of its cause, as a clinical matter, capable of producing digestive symptoms in itself and that these may simulate the symptomatology of most other disorders of the abdomen; and that chronic duodenitis, focal infections and biological errors in the gut can produce dysfunction and disease of this gland. The pancreas is an organ of sequence in the chain of spreading abdominal pathology. It is by no means isolated from effect as its location would suggest, and when affected and in dysfunction unless the cause can be removed and done early enough therapeutically there is little that can be done to relieve the symptoms with the knowledge of therapy we have today.

We have had experience as follows: Several instances of what may be called subacute indigestion, which heretofore were benefitted in any way, that responded magically to pancreas feeding. I believe them to be due to functional depression of the secretion.

Several times in late pulmonary tuberculosis; carcinoma (other than gastric); two instances of pernicious anemia; subacute septicemia; typhoid; combined degeneration of the cord, and in marked debility there has been benefit from suggested therapy—in these I feel that a deficiency of secretion due to adynemia of the gland existed.

Following a sharp attack of biliary colic the soreness in the upper abdomen may exist with anorexia for some days. At this time the pancreatic function is low and is helped by alkalies and pancreatic substance. There may be present then a transient hypopancreorrhea of reflex origin or an acute congestion of the head of the pancreas with low function of the organ.

There were several instances of arteriosclerosis in which, no doubt, the splanchnic vessels were involved causing a low pancreatic ability from deficient blood supply. In these, pancreatic feeding relieved the digestive distress and brought about satisfaction to the patient.

One case of large cyst of the pancreas was followed by digestive distress after operation, a low pancreatic ability was present and the symptoms were relieved by pancreatic feedings of the whole gland, pickled and eaten as a salad each day.

In the primary organic group not much that is encouraging can be stated. A slight degree of symptomatic benefit may come from pancreas therapy and should be tried but when distinct intrapancreatitis or interpancreatitis exists, a marked sclerosis of the head, hemachromatosis, abscess, multiple cysts or hyaline degeneration of the gland but little help is accomplished. Occasionally where diabetes is constant and not controllable, feeding with the pickled whole gland is worth the while.

In the secondary organic group more encouraging results are met with. Of course, where the gland is diseased with carcinoma, syphilis or tuberculosis not much can be expected and the same may be said of sarcoma, late cirrhosis of the liver, Addison's disease, obstruction of the duct of Wirsung or those rare instances of multiple pancreatic calculi. But even here occasionally some symptomatic relief may come. When the gland is in dysfunction in chronic duodenitis, infections of the bile passages and in late achylia cases where a general atrophy of the stomach glandularis exists the relief of symptoms from the gland therapy is often efficient. Here benefit accrues from the taking of an alkaline water followed by pancreatin also in alkaline water before meals, pancreas feeding, or pancreatin with soda bicarbonate, or the least efficient, enteric coated capsules.

On the whole there is no harm in therapy of this sort and it is always worthy of a trial when the test shows the gland's amylopsin units are less than normal.

The Oblique Transrectus Incision for Operations Upon the Gallbladder and Extrahepatic Bile Passages

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The practical characteristics which determine the value of any abdominal incision include, 1, the ease of execution, including the making and closing of the incision; 2, the visibility of the intraabdominal organs, and the ease of intraabdominal manipulation; 3, the possibility of enlargement of the incision when the necessary contingency arises; 4, the possibilities of drainage; and 5, the likelihood of subsequent hernia. In any given case the last two factors are fixed and are independent of any given personality; the status of the first three are always dependent upon the personal equation and characteristics of the operator. These considerations have governed the following remarks as far as possible.

In operating in the right upper quadrant of the abdominal cavity, many surgeons have become dissatisfied with the usually made vertical rectus incision, especially when operating upon the extrahepatic portion of the biliary system—the gallbladder, the cystic, hepatic and common ducts. The difficulties usually encountered are said to include insufficient exposure, difficulty or impossibility of properly closing the incision, and the tendency of all vertical incisions to gape under strain, thus forming, perhaps, a predisposition to the subsequent appearance of hernia in the scar.

Other types of incision have, therefore, been proposed and practised, all of which attempt to obviate the disadvantages of the vertical type. The incisions proposed as a substitute for the vertical one generally conform to one of several types: 1. The vertical line is abandoned altogether and the line of direction of the incision is transverse (Duncan, Morison, Sprengle). 2. A transverse incision is

combined with a vertical one (Perthes, Czerny, Koenig-Kehr). 3. An oblique incision is made directly through the abdominal wall (Curvoisier, Kocher, Kohrte). 4. A vertical incision is combined with an oblique one (Mayo Robson).

More recently in this country attention has been called to the transverse incision by Farr, by Moschcowitz, and by Meyer. It has been recognized that an incision made in the transverse direction loses the tendency to gape during strain and closes more tightly together. Importance is laid upon the unexcelled visibility of the abdominal viscera through this incision and upon the ease of closure. In the earlier reports it was affirmed that a reopening of the wound hardly ever occurred, even if it became infected; and that necrosis of the fascia was practically never seen even in the presence of infection; subsequent hernia did not occur in the first groups of reported cases. Drainage is possible at any point.

The disadvantages of the transverse incision are: 1, the excessive length of time consumed in making and suturing the incision; 2, the impossibility of easily and properly rotating the liver out of the belly; 3, the occasional insufficient exposure; and 4, the difficulties encountered in attempting to reach other viscera (organs in the lower half of the abdominal cavity—appendix, caput coli, etc.) The only method of enlarging the transverse incision adequately, when such contingency arises, is to add a vertical limb to the transverse incision; the former can be directed either upwards (the Koenig-Kehr method) or downwards. If for one or another reason the addition is not possible or advisable, the only thing left to do is to close the original incision altogether and start anew.

I have never been attracted to the transverse incision and I have personally never made use of it. I have seen accidents happen in transversely made incisions, as well as in others. I have seen the wound break open in the absence of infections. There are also by now instances in which herniæ have subsequently appeared. One of the reasons for these accidents lies in the character of the incision in which the various layers of the abdominal wall are divided in one plane. This would make a fault in any kind of an incision. There is also no opportunity for any overlapping of the various layers, or no possibility for one layer of the abdominal wall—the muscle—to protect the suture line in the other layers by overlying them. Such advantage is only secured by altering the plane of incision in each of the layers of the abdominal wall. If for any reason—the poor condition of the patient, for instance—union between the cut surfaces is not immediate and firm, the absorption or weakening of the absorbable sutures customarily used makes for ideal conditions in which the slightest strain on the part of the individual causes the wound surfaces to part—this in spite of the tendency all transverse incisions have of closing more tightly together during exertion.

Another important factor in transverse incisions is the length of time necessary for their proper making and, especially, for their proper closure. If one does not possess the gift of rapid operating, this may equal almost or exceed the time necessary for the entire intraabdominal manipulation. Rapidity of operating is of maximum importance in my patient not in the best of condition and of great value in any other patient; modern surgery has taught everyone that the ability to "go in and get out" quickly in abdominal operations with the maximum speed consistent with thorough and efficient work is directly proportional to the comfort, absence of complications, rapidity of healing and shortness of the postoperative convalescence. With a slow operator, the time consumed in closing a transverse incision, if carefully done, can become interminable.

I have, however, seen a number of cases in which the transverse abdominal incision has seemed to have an especial indication. I refer to the cases in which at previous times it had been found necessary to operate repeatedly in the upper abdomen, so that at the time of presentation the upper abdomen bears three or four vertical scars. Each of these necessarily bears its full quota of intraabdominal adhesions, oftentimes made more complicated by the fusion of the one with any or all of the others. If laparotomy is again indicated, it has seemed to me that a transversely placed incision would give access to all of the adhesions resulting from the previous operations, would enable a more rapid, less difficult and less dangerous separation of them, and a more adequate exposure of the operative field, and would relieve the operator from the impediment of adhesions which he could not reach through any single vertical incision. In one particular case which I have in mind the transverse incision proved an excellent one, and accomplished everything that was hoped for.

The combination of a transverse and a vertical incision, the rectangular incision, is the type characteristic of the older surgery—that done twenty or more years ago—and of the German school. The first of these was proposed and practised by Koenig and Kehr. It consists in making an incision through all the layers of the abdominal wall from the xiphoid along or through the inner border of the rectus muscle and then extending it at right angles to about the anterior axillary line. The line of incision extends in the same plane through the layers of the abdominal wall. Before dividing the rectus muscle, it is stitched to the fascia as in the ordinary transverse incision. The access obtained and the visibility is superb. Drains may emerge at any point of the incision.

The second variety is the Perthes incision, in which a rectangular skin muscle flap is raised. All the structures down to the posterior rectus sheath are incised as in the Koenig-Kehr incision; the muscle is also stitched to the anterior rectus sheath. The whole mass is reflected backward as far as the costal margin. The posterior rectus sheath and the peritoneum are incised in an oblique line parallel to the costal margin and about one third of an inch in front of the point of emergence of the last two intercostal nerves.

In America, Willy Meyer has, apparently, had most experience with this general type of incision. The superior advantages of the Perthes incision is said to include: 1, an exceptionally wide access; 2, preservation of the nerve supply; 3, the difference in plane of incision between the skin muscle flap and the posterior rectus sheath and peritoneum; 4, the possibility of rotating the liver out of the belly; 5, less packing is required; 6, drainage can be carried

out at either end of the incision and not at the centre.

In cases of necessity it is a most difficult matter properly to enlarge the Perthes type of incision without undue mutilation of the muscular tissues of the abdominal wall. The Kohrte-Kehr type of rectangular incision is superior from this point of view, although the mutilation of tissue is also unduly excessive; the incision can be enlarged at either of its ends; the transverse limb may be continued across

Fig. 1. Fig. 2. Fig. 3.

Fig. 1.—Projection surface anatomy of the organs in the right hypochondrium. The heavy dotted line indicates the margin of the rectus sheath. The oblique heavy solid line shows the line of incision through the skin and the anterior sheath of the rectus muscle. The centre of the incision overlies the junction of the common and hepatic ducts.

Fig. 2.—The drawing shows the anterior rectus sheath. The heavy solid line represents the line of incision through the anterior rectus sheath and shows the relation of the incision to the costal margin and to the outer and inner margins of the rectus sheath.

Fig. 3.—The drawing shows the interior of the rectus sheath after the anterior sheath has been cut away and the rectus muscle has been removed. The cut surfaces of the muscle are shown at the upper and lower limits of the sheath. The costal arch is shown at the upper left hand corner. The floor is the posterior rectus sheath and the heavy solid line shows the line of incision through it. In actual practice the rectus muscle would have been separated in the course of its fibres and retracted laterally.

the abdominal wall to the opposite side; or the vertical portion may be continued downwards below the level of the transverse. All such manipulations, however, consume an excessive amount of time which could be more profitably employed.

If the vertical limb is made to run through the linea alba it becomes a source of weakness. The junction of the two lines of incision is a point of special weakness. In either case the potentialities for a postoperative hernia are at their maximum.

The disadvantage of the rectangular type of incision—the combination of a vertical and transverse incision—represents exaggerations of those characteristic of the transverse incision alone and are added to by those of rectical incision. The time consumed in making and, especially, in closing such a wound is out of all proportion to that required for the intra-abdominal manipulation. When the whole thickness of the flap is considered it is seen to form more or less of an impediment because of its very bulk, and in stout subjects the impediment becomes considerable. Apparently, whatever is gained in visibility and in increased accessibility is more than lost in one of several other directions. The fact that this type of incision is so seldom employed in American circles points rather forcibly to the fact that in this country, at least, the disadvantages are considered far to outweigh the advantages.

An oblique incision was proposed by Curvoisier and practised also by Kocher and Kohrte. This practically follows the oblique direction of the posterior rectus-sheath-peritoneum portion of the Perthes incision; the line of incision extends, however, through the entire thickness of the abdominal wall in the same plane. Visibility and accessibility are good with this type of incision and the liver can be rotated out of the abdominal cavity. The possibilities of extending the incision in case of necessity are practically of the maximum degree; but any enlargement is made at the expense of mutilation of the broad muscles of the abdominal wall which, at least to my ways of thinking, is entirely unnecessary and unjustified. Drainage can, of course, be carried out at any point of the incision.

The disadvantages of the oblique incision are practically the same as those of the transverse incision.

In operations in the upper abdomen, Arce, of Buenos Ayres, uses the following incision: A transverse skin incision is made from a point two fingers breadth outside of the median line to the axillary line, a little beneath the costal margin and running approximately two inches above the umbilicus. When the skin and cellular tissues are divided the fibres of the external oblique muscle are separated widely as the wound will allow and down to the external edge of the sheath of the rectus muscle. The fibres of the internal oblique muscle, seen running through the lower border of the wound aperture, are also similarly separated in all of their visible extent. The anterior part of the rectus sheath is divided transversely and the rectus muscle is retracted inwards. The transverse abdominal muscle and the posterior rectus sheath and peritoneum are then sectioned transversely.

This is practically a McBurney incision in the upper abdomen combined with the Weir modification. Free use of drainage would be difficult except at a point outside of the rectus sheath. The suture of the wound would occupy much time, if properly done. If such a wound ever became infected, the resulting suppuration would be widely spread, would occupy practically every layer of the abdominal wall inside and outside of the rectus sheath, would be accompanied with much fascial sloughing, and the potentialities for a subsequent hernia would be of maximum degree. The hernia would be a large one and its repair would be difficult. I do not know of anyone who has had experience with this incision when made in the upper abdomen except Arce. Personally, I cannot see its value. The very fact that Arce must make free and liberal use of retraction indicates that the resulting net opening does not always satisfy him and would not satisfy most operators; that there is more or less cramping. Nevertheless, Arce has done twenty-four laparotomies with this incision and is very satisfied with it.

Taken all in all, it seems fair to say that the type of incision in which a vertical limb is combined with a transverse or oblique limb has not completely filled the bill. The simple oblique type of incision—Curvoisier—has also been unsatisfactory.

For the last ten years I have been making use of an incision for operations upon the gallbladder and bile ducts which I believe combines the best qualities of all of the various incisions described above. I make it as follows:

An oblique incision is made beginning practically at the median line and high up near the ensiform and proceeding downward and outward to the outer border of the rectus sheath. The obliquity of the incision depends a great deal upon the amount of adipose tissue present, and upon whether the subject is of the long, thin type or of the short, thickset type.

The point where the incision begins depends also upon the character and size of any mass which may be present, but as a general rule, I begin the incision about one inch below the ensiform process. This incision divides the skin, the subcutaneous tissue and the anterior sheath of the rectus muscle in the same plane. The fibres of the rectus muscle are bluntly separated and retracted. The plane of this division is usually at about the centre of the muscle. Sometimes, when the gallbladder lies rather far out, the muscle fibres are separated near the outer border of the muscle; very seldom is it necessary to make the division closer to the median line. The muscle is usually of sufficient pliability to stretch easily under retraction so that the entire length of the incision is exposed. If any fibrous intersection intervenes, the intersection is first dissected free from the overlying sheath of the muscle, before the muscle fibres are bluntly separated. Too vigorous retraction in the hands of an inexperienced assistant sometimes results in tearing the muscle, but this can and should be avoided.

The posterior rectus sheath and the peritoneum are divided in the same plane, or a little to one side of the plane of the superficial part of the incision going through the skin, subcutaneous tissue and anterior rectus sheath. The course of the incision, however, corresponds exactly in its obliquity to the latter. This results in an oblique incision in which all layers of the abdominal wall with the exception of the rectus muscle are divided in an oblique direction, in which the rectus muscle is not divided across its fibres, but only bluntly separated and in which the entire incision lies within the confines of the rectus sheath.

By altering the obliquity the incision can be made as large or as small as one wishes, or expects to need for the adequate accomplishment of the intraabdominal manipulations. The average operator can almost always know in advance just how large an incision will be necessary and the incision can be planned accordingly. The possibilities for drainage are as good as in any other similar incision of the best type. The incision can be rapidly made and just as rapidly closed. When well made this incision gives the most adequate exposure at the point most needed—just at the neck of the gallbladder and the junction of the cystic, hepatic, and common ducts. This point, the centre of the entire operative attack, lies directly under the centre of the incision. The liver can be easily rotated out of the abdomen and visibility and ease of access are the par of any, and superior to many of the other types of incisions previously described; in a thin subject these are superb.

This incision avoids all the disadvantages characteristic of the transverse or oblique incisions, or of combinations of these with the vertical incision in or near the midline. There is no division of any muscle fibres, either in the rectus muscle or in the broad muscles of the abdominal wall. The nerves are not divided at any point. The various layers of the abdominal wall are divided in various planes; the suture of the one protects the other; and the intact rectus muscle guards the whole.

The incision contains all the best qualities of the transverse (Duncan, Morison, Sprengle) and of the oblique (Curvoisier) incisions. There is approximately the same ease of exposure and the same visibility. The line of incision approaches the lines in which strain of any kind approximates and does not distract the lines of incision. In suturing the wound, the difficulty in approximating the peritoneum, usually encountered in vertical rectus splitting incision, is absent and the suture can be done with ease.

There is no difficulty in reaching, exploring and operating upon other organs in the vicinity of the upper right quadrant. I have sewed up perforated ulcers in the duodenum or stomach. I have done pylorectomy. Many times it has been easily feasible to reach down and remove the appendix without enlarging the incision. One time I did a nephrectomy when I accidentally found a hypernephroma. In isolated instances in which it was found necessary to enlarge the incision, it was possible to do so with the greatest of ease and with the loss of only a few seconds of time. This was done by continuing the incision downward as a vertical prolongation of the oblique; all of this was done within the rectus sheath and did not materially alter the primary incision.

One can see that this incision has the best qualities of the vertical types of incisions practised; of the muscle splitting, or Kammerer type of incision. Easily these, as a general class, are the superior of any type of incision made. They are easy to make and just as easy to sew up. They take the least time. They heal easily, quickly, and efficiently. They give the best access and the most visibility. They are easy to enlarge and the enlargement can reach any proportion desired. One can reach equally well above and below and to the left side almost as well, as quickly, and as easily as in the right. Infection in the line of incision does not spread within the layers of the broad muscles of the abdominal wall, is rapidly localized and controlled, is easily dealt with, and heals most quickly.

It has always appeared to me that while one ought not to bind oneself absolutely to any one incision and that one should, as far as possible, have an equal facility with all types of incision, for ordinary work and for the average surgeon, it is much the better plan to school oneself in one type of incision and to make use of that as far and as often as possible. With added and repeated practice the incision becomes better and better, easier and easier, more and more adapted to all of the given purposes. One learns to handle such an incision to the greatest advantage and things that are at first difficult later become of no difficulty at all. The search after new incisions, the transverse or other, sometimes defeats its own purpose.

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Historical Medicine

The Note Book of a Guy's Hospital Student

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Recently I have become the possessor of an interleaved book entitled "A Syllabus of the Lectures on Midwifery Delivered at Guy's Hospital and at Dr. Lowder's and Dr. Haighton's Theatre, in St. Savior's Churchyard, Southwark." The book was reprinted in London in 1799, and the interleaves fully written up by Thomas Gething Williams, who practised the art of medicine for many years in Swansea.

There is one interesting note on the *Diseases of Infants Requiring Medical Treatment,* of which Williams has written: "It must be evident that it is a difficult part of Medicine, consequently Practitioners do not much like it, the causes of complaints not being at all evident, not being able to get any information respecting them as an adult can give you, it is common to ask the nurse questions. They often form opinions of their own of the causes, & would mislead you, therefore do not suffer your judgement to be misled by them, only ask questions of the feeding of child." "A set of questions laid down which are to be asked in all cases, which are respecting the actions of child, whether it draws its knees up, which is a sign of Gripes; if it puts its fingers to its Gums & pull them about, a sign of teething; if it picks its nose, a sign of irritation of the Intestines, as worms; fretful & puts the hand often to the head and shifts it about often it may be hydrocephalus"

The punctuation can hardly be said to be first class, while the simplicity of the diagnosis is such as to appeal to the most tired student in the university.

With regard to Cæsarean section he writes: "It is impossible to say how many would recover from it out of a number but the probability is from the injury necessarily done in the performing of it that but one out of a number would be saved. Many have thought that the admission of air into the cavity of the abdomen did the most injury, & was the principal cause of death in those cases, but Dr. Haighton does not think so & has proved by experiments in animals that air does not do the mischief, but that it is the injury done to the parts otherwise is the cause of death."

If Dr. Haighton had but carried on with his vivisection experiments, it is quite possible that Guy's might have been in the position to claim the honor of having enunciated the germ theory, though on second thoughts I think that even with that 'if,' the credit belongs to an Englishman named E. Maynwaringe, Doctor in Physick, who published a book in 1673 on *The History & Mystery of the Venereal Lues or French Disease.* He tells us in this book, "To the act of infection there are three *requisites,* the person or body *infecting* that does communicate; secondly the virulent Miasm transmitted or communicated; thirdly the person infected." "In the next place we are to consider what these *miasms* or infectious seminaries are that pass from body to body. Some call them *vapour,* others a *spirit,* but we shall not trouble ourselves upon the name, provided we rightly know what is meant thereby." "We are therefore to understand them as corpuscles or subtile finer invisible bodies, which are minute small portions, exhaling from infected bodies of the same nature & taint as the bodies from whence they were emitted. These venenous *particles* of contagious matter are agile and penetrative, that they insinuate themselves through the pores of other bodies; and being entered do then ferment and operate to alter, & change their new *receptacles,* and *tincture* them with the like *labes* of their own virulent nature."

Is Maynwaringe an old Guy's student? If so, the hospital can still lay claim to one who, in the words quoted above, has been undoubtedly the first to enunciate in unmistakable terms the fundamental idea underlying the modern germ theory. In 1672 or over two hundred and fifty years ago, just after the Commonwealth had become a matter of past history, this unrecognized genius enunciated the theory which in the hands of Lister and his pupils has changed the whole outlook of surgery as well as of medicine.

Hear what Maynwaringe has to say of phthisis: "and as for a phthisis, why that should be infectious to the lungs of another, there is good reason for it; because the *corrupt* breath going out of the *phthisical* person is drawn in & received by another, and having imbibed *phthisical* corruptive *miasms* in the breath, may lodge & fix there, changing the natural *tone* of the lungs into a *tabid* & corruptive state."

Turning back to Gething William's notebook, one finds a few words on lues venerea in infants, and it is interesting to note that Dr. Haighton uses the same nomenclature as Maynwaringe—the venereal lues. "The 3d Division is those diseases that make their appearance after Birth as Venereal Disease. A case of this kind would be more equivocal in an Infant than in adults, as they inform you of circumstances by which you could decide that it was such in children you are not to expect sores on the genitals more than any other part, they receive it from the mother, therefore it is in her proved to throw some light on it. They will be candid sometimes & say they have been injured by their husband."

One cannot but feel that the information communicated to Gething Williams as evidenced by his notes is very important (although he writes fully), and compared with the very full information which we get from Maynwaringe in 1673, it is very unsatisfactory. Maynwaringe points out how syphilis in infants is either "*hereditary* or adventitious," but to a student like Williams no such instruction seems to have been given.

Williams tells us that "Dr. Haighton recommends all to be backward in recommending wet nurses as they are always more troublesome than other servants, give themselves airs, etc., & their characters may be bad as to the health of the woman & the goodness of milk, can't say that will be proved from the effects on a child. Should never recommend any so as to be at all responsible for them—might be diseased. An instance of Dr. Orm getting into a scrape by recommending a Nurse who had the venereal disease. She gave it to the footman, & he to the Housemaid. The master was likewise fond of the Nurse. She gave him the venereal disease, & he gave it to his wife the mistress."

With this tale the notes end but on the last page are printed the Regulations for midwifery students on the District.

1. Each gentleman will have labors in proportion to the number of courses he subscribes to, and will be served in rotation as nearly as the nature of things will allow.

2. Before any gentleman is called upon to act he will have an opportunity of attending the lying in house, where he will have the means of acquiring the necessary preparatory knowledge.

3. No gentleman who has been called upon to attend a labor either at the lying-in-house, or at a private house, can be permitted to take with him another who has *not* been called to it; nor can he send another in his stead.

4. Notice to be in readiness to attend a labor will (when time will allow) be given to each gentleman, either by verbal message or in writing; & it is recommended to him to accept of the offer if possible; in any case a decided answer is expected.

5. Every gentleman engaging to attend a labor when called on, will (agreeably to his own promise) be expected to hold himself in readiness for that purpose; but in case of failure, & it becomes necessary to send another in his stead (a circumstance that must always be attended with vast delay & much inconvenience, & often danger to the patient) the gentleman committing such neglect forfeits one labor from the number allotted to him.

6. Every gentleman who goes to a labor is expected to stay until it is finished but in case he is called where the patient is under a mistake, he may leave her, having personally taken proper methods to acquire the necessary information. In this case it is recommended to him to call on her again soon, & in case of disease Dr. Haighton should be informed of it.

7. In case of difficulty or danger during labor, the gentleman attending is requested to send, if possible, a written message to Dr. Haighton; but he is on no accord to leave the patient.

8. It is recommended to each gentleman going to a labor to have with him an opiate, and some common aperient medicine, such being frequently wanted after delivery.

9. As every gentleman undertaking a labor necessarily pledges himself to attend the woman during her recovery, he will consequently see the propriety of calling on her each day until she is in a perfectly safe condition, & in cases of serious indisposition Dr. Haighton should be informed of it.

Contributors to the Science of Medicine

Pierre and Marie Curie

It would be impossible to write a sketch of the life and work of one of the Curies without including an equal amount of material about the other. So closely allied were they in their lives, work, thought, and ideals, that even now, when Pierre Curie is no longer here to carry on his great service to science and to mankind, his wife lives only to perpetuate their common work and aims.

Pierre Curie's parents were intelligent, educated members of the bourgeoisie, with small means. His father and grandfather were physicians. The family was of Alsatian and Protestant origin. Dr. Eugène Curie, Pierre's father, received his scientific and medical education in Paris. He was a man of unusual charm and handsome appearance, and of brilliant mentality. He had wished to consecrate his life to science, but the responsibilities of family life had made it necessary for him to practice medicine instead. Throughout his life, however, he continued to make as many scientific investigations as possible, especially in the natural sciences. He loved the country, with its plants and animals, and this love and interest were shared by Pierre, who always found adjustment to city life difficult. Although Eugène Curie's medical career was a modest one, it showed nevertheless unusual qualities of devotion and disinterestedness. During the Revolution of 1848 the French government conferred a medal upon him "for honorable and courageous conduct" in treating the wounded. During the subsequent epidemic of cholera, he installed himself in a quarter of Paris that had been deserted by physicians, in order to care for the sick. During the Commune he established a hospital in his apartment and cared for the wounded there. He was a freethinker and an anticlerical, did not have his children baptized, nor encouraged them to follow any form of religious exercise in their family life. Their mother, Claire Depouilly, came of a rich manufacturer's family, who, however, lost all their wealth because of the Revolution. These losses and the reverses suffered also by Eugène Curie in his medical practice from the same cause were bravely and even gaily borne by the young wife and mother. These traits and qualities of the parents, and the general atmosphere of refinement and culture, high ideals,

modest living, and gentleness and affection in family life, were reflected in the lives and characters of the two sons, Jacques and Pierre.

Pierre was born on May 15, 1859. He was three and a half years younger than his brother Jacques. The two brothers were devoted and whenever possible in the closest contact throughout their lives. They were very different in temperament and personality, but this seemed to increase their affection and congeniality. One of the little Pierre's earliest memories was of a battle near their house in Paris during the Commune, of the hospital established by his father there, and of the expeditions made by him and Jacques to search for the wounded.

PIERRE CURIE

MARIE CURIE

Pierre never went to school in his boyhood. His mother taught him at home, then his father and his older brother, whose attendance at school had also been very limited.

Pierre would accompany his father on country rambles when they lived at Sceaux, and the two would never tire of observing and studying the plants, birds, and animals which they found along the way. The father's natural taste for literature and his excellent library were the sources of Pierre's early education along these lines. When he was fourteen, he became a pupil of Professor Bazille, who taught him Latin, in which he was sadly remiss, and mathematics, for which he had a remarkable aptitude. Thus began the training which was back of so much of Curie's later work with physical laws and phenomena. Thanks to his rapid progress in mathematics, he became a bachelor of science at sixteen. Soon after he began to prepare for his licentiate in physics, taking courses at the Sorbonne, working in the laboratory of the School of Pharmacy, and with his brother in his chemistry courses. He received his licentiate in the physical sciences when he was eighteen years of age, and at nineteen was appointed preparator for Desains in the physical laboratory of the University of Paris. It was here that he began his experimental research.

Madame Curie describes him at this time as a tall, slender young man with chestnut hair and a shy and reserved expression, but with a profound inner life mirrored in his youthful face. His vacations were always spent in the country with his brother. The two would take long tramps, sometimes lasting for days at a time, interspersed by swimming, diving and other outdoor sports. They would then return, happy and refreshed, to their laboratories in Paris, ready for their investigations. Their first great success was the discovery of the hitherto unknown phenomena of piezoelectricity, or polarization produced by the compression or expansion of crystals in the direction of the axis of symmetry. The piezoelectric property of quartz has recently been utilized in the production of elastic waves of high frequency sent out in water to detect submarine obstacles. In 1883 Pierre was made director of laboratory work in the School of Industrial Physics and Chemistry of Paris, where he later became professor. He spent twenty-two years of his life in these old buildings of the College Rollin, where he was greatly loved and admired by all who came near enough to him to break through his temperamental reserve and shyness. The whole period of his scientific career is marked chiefly by desperate struggles to achieve results with limited and poor equipment, lack of funds, a bare livelihood for his personal necessities, and for the most part lack of appreciation by the scientific world, perhaps caused or at least augmented by his positive refusal to advertise either his work or himself; to ask for any advances, either of pay or position; to accept any honors; or even to appear in public except when it became absolutely necessary. He had reached the age of thirty-five before he decided to present his doctor's thesis—the results of his work on magnetism.

In 1894, Pierre Curie met Marie Sklodowska, of Warsaw, the daughter of Catholic Polish parents, both of whom were teachers in the elementary schools of Warsaw. At this time she was in Paris fulfilling a long cherished dream of studying science in the French capital. They became friends at once through the discussion of scientific and sociological subjects, and it was not long before Pierre realized that this serious, intelligent Polish girl was, as he would often tell her later, the "wife made expressly for him to share all his preoccupations." Yet he was able to write to her before they were married: "We have promised each other (is it not true?) to have, the one for the other, at least a great affection. Provided that you do not change your mind! For there are no promises that hold; these are things that do not admit of compulsion."

He was married at the age of thirty-six, an advanced age in France for matrimony. He had believed that it would never be possible for him to find a wife who could live his dream with him. That he did so has been amply proved. His unshakable faith in science, and in its power to further the good of humanity remained throughout his life. Like Pasteur, he "believed invincibly that science and peace will triumph over ignorance and war."

The first home of the young couple was a very simple one, consisting of a little three room apartment whose chief attraction was a view of a large and beautiful garden. Madame Curie did all the house work, ordering it so as to interrupt as little as possible the scientific researches which she was permitted to carry on with her husband in his laboratory. They spent their short vacations walking or bicycling in the country near Paris, until the arrival of their baby Irene. Shortly after this event Pierre's mother died, and Dr. Curie came to live with the young couple, thus helping to solve happily the problem of someone to help care for the baby while the mother was busy in the laboratory.

Marie Curie's attention had been already caught by Henri Becquerel's accidental discovery of the spontaneous emission by uranium salts of peculiar rays. Also Röntgen's recent discovery of x rays was then arousing much interest and exciting the imagination. Experiments along this line led to peculiar phenomena of so interesting and unusual a character that Pierre Curie abandoned his work on crystals to join his wife in her investigations. The detailed and complicated steps leading to the discovery in 1898 of the existence of polonium, and, a few months subsequently, of radium, after an all night vigil in the laboratory, are too involved and technical for repetition here. The remarkable thing is to remember that for two whole years these investigations, which led finally to the reduction to nothing of the theory of the absolute fixity of the whole atomic edifice of science, were made in a wooden shed with a glass roof, far from rainproof; with no heat but a stove which barely warmed its immediate vicinity; and with no means of getting rid of the poisonous gases thrown off by the chemical treatments, so that when weather permitted these processes had to be conducted out in the court. Dust and dirt interfered with results, and there was no equipment but a few rough, worn pine tables, and a blackboard. At first the work was financed from the meagre resources of the Curies themselves; later a few donations were received. No assistant could be afforded, so often Madame Curie would pass most of the night stirring the compounds in their great containers with an iron bar almost as big as herself. Their greatest joy was to return to their rude shed in the evening and survey their domain in the darkness, their precious, unprotected products on the tables and shelves against the walls, gleaming faintly like souls being born out of the void.

Finally appreciation, fame and many honors, few of which were publicly accepted, came to the Curies, and in the end more ample remuneration so that life was made comfortable, at least, and assistance and equipment for their work became feasible. A second daughter was born, and the little family, still including Dr. Curie, passed a happy time in the little house in the Boulevard Kellermann. Pierre Curie in 1904 was named titular professor of the Faculty of Sciences of Paris. Just as prosperity and ease were becoming actual facts, came the brutal accident which snuffed out a life that had meant already more than is yet known to science and human welfare, and was destined to mean infinitely more. Pierre Curie, leaving a reunion of the Professors of the Faculties, was crossing the street when he was struck by a motor truck and instantly killed. His wife writes: "So perished the hope founded on the wonderful being who thus ceased to be. In the study room to which he was never to return, the water buttercups he had brought from the country were still fresh."

It is of some consolation to know that, in the carrying on of the work undertaken with her husband, Madame Curie has at last been provided by various individuals, institutions and organizations with the means to do it in the proper manner and under favorable conditions. The story of the presentation to her of a gramme of radium by the women of America, and of her visit to this country a few years ago to receive it, is well known. Perhaps the most characteristic incident of that visit was Madame Curie's refusal to accept the radium, even for one night—"I might die," she said—in her own name, and her insistence that a new "deed" be drawn up at once, making it the property of the Institut du Radium of Paris. She, like her husband, believes, and lives up to the belief, that "in science we should be interested in things, not persons."

Under the Red Light

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"Then take scarlet cloth and completely envelope the smallpox patient therein. I followed this practice in the case of the grandson of the very noble King of England, who suffered from this malady. I insisted firmly that everything surrounding the (patient's) bed should be red and thus I cured him without any remaining trace of his variola." This sentence translated from John of Gaddesden's *Rosa Anglica*, the first edition of which was published in 1492, is the first printed mention made of an original means of treating the eruptive fevers. Whether or not this treatment was known before the time of Gaddesden, who lived between 1280 (?) to 1361, is difficult to state with certainty, but it is infinitely probable that it was, regardless of the fact that it is not referred to by any of the Greek or Latin writ-

ers, with the exception of a verse of Propertius which is far from being convincing. But China and Japan knew it from time immemorial, and it is a curious fact that this practice is still greatly in vogue in various parts of the world, in Caucasus as in the Voges and Poitou, at Tonkin as in Roumania. The fact that this treatment is so universally known might seem a proof of its antiquity.

From Gaddesden's day we meet—as we descend the course of the centuries—this therapeutic measure referred to by numerous writers—thus in 1537 by Astiarius, Simon de Vallembert in 1565, a little later by Mercurialis, and after him, by Ambroise Paré; G. Blaise in 1656, Eloy in 1744, Rosen de Rosenstein in 1778. Then came the nineteenth century, during which this therapeutic measure fell into disrepute, until the day came when Finsen, in 1893, took it up again and developed the indications for erythrotherapy.

At the Folk-Lore Museum at Antwerp is exhibited a red silk scarf, which was used to treat sore throat, a custom which still is in vogue among the peasants of Poitou.

The ancient Chinese physicians applied a swab of cotton impregnated with carthamin and soaked in a solution of red pigamon which was applied over the region where the first pustules of smallpox appeared. Recently, this direct treatment has been resorted to by means of fuchsin and scarlet red. There is a race in Australia who swab the face of a patient ill with measles with dog's blood. More frequently, however, red clothing is used, and King Charles V was dressed in red shirt, stockings, and veils, when stricken with smallpox.

Quest of the Unicorn in Fact and Fable

The announcement that MacMillan has brought back from the Arctic seas a tusk of the narwhal, one of the least known of all mammals, brings to mind a curious superstition which began with the ancient Greeks and which may not be quite dead today, writes Odell Shepard (*New York Times Magazine,* October 19, 1924). From the fourteenth to the seventeenth centuries, Scandinavian sea rovers scoured the north Atlantic in open boats, looking for narwhal tusks, which they sold to kings and princes of Europe for fabulous prices. No banquet table was thought complete or even safe without one. Those who could not afford an entire horn were glad to get small pieces, which they had carved into drinking cups or set into the handles of their table knives. For these overgrown teeth of a small sea mammal were thought to be the horn of the magical unicorn of fable, which, according to the best authorities of the Middle Ages, had the interesting and valuable habit of breaking into a profuse and visible perspiration whenever poison of any kind was brought into its presence. "It was this habit which attracted the attention and won the enthusiastic approval of the crowned heads of Europe, and particularly of the Italian tyrants. Every one of these men felt that he must own a horn in order that he might sit down to a dinner without feeling that he might never arise, without suspecting every dish set before him. . . . . Everyone except the professional poisoners believed in the horn's efficacy, and continued to do so until the classic age of poisoning had gone by." Among other devices used at this time for detecting poisons were snakes' tongues suspended above dinner tables on gilded tongue stands; the supposed horns of the cerastes, a fabulous Egyptian serpent, were similarly treated. In less wealthy establishments, the vulture's foot was hung over the flame of a candle in the belief that when poison was brought upon the table it would extinguish the flame.

So far as is recorded, the earliest authority to write about the unicorn was Ctesias, a Greek physician at the Persian court, who lived in the fifth century B. C. and wrote a book about India. In this book he describes the unicorn as having a white body, a red head, and blue eyes. "Each has a horn the base of which is white, the end red, and the middle black. Drinking cups are made of these horns, and those who drink out of them are said to be subject neither to spasms nor to epilepsy, nor to the effects of poison." Aristotle, Aelian and Pliny all repeat this description, except the color scheme. The Christian symbolism in which the unicorn represents Christ is well known. "Belief in the unicorn and in its miraculous powers thus became almost an article of religion. The animal became almost sacred so that any man who doubted that its horn could detect poison would probably have been rated as an infidel. Even the most critical went no further than to propose a series of tests whereby the true horn could be known from the false. The real horn was said to produce bubbles when thrown into water, to purify poisoned wine, and to perspire in the presence of poison."

The unicorn superstition flourished until about the middle of the seventeenth century, when the scholar Kirschmayer saw a narwhal sporting the supposed horn of the unicorn. He communicated his doubts, and suspicion increased until the Great Sophy sent a horn to Charles II, who turned it over to the recently founded Royal Society of London to experiment on. The investigators surrounded the horn with all the deadliest poisons known, but nothing at all happened. Yet for a long time the delusion was cherished, even Sir Thomas Browne in his *Vulgar Errors* treating the animal very cautiously; but his son, Dr. Edward Browne, was quite disillusioned, speaking of unicorn horns in 1685 as a drug on the market. Nevertheless powdered unicorn horn was still in request for more than a hundred years after the Royal Society's experiment, and was kept on the official pharmacopœia of London until 1742. In the royal court of France a horn was used for testing the King's food until the Revolution of 1879 devised a better way of getting rid of kings. In Hogarth's painting, Marriage à la Mode, a narwhal tusk may be seen hanging on the wall of the quack doctor's shop.

Editorial Articles

HERE AND HEREAFTER

It is not an ordinary occurrence that can turn the stomach of a physician, but we have to confess to a sense of nausea in looking over a parliamentary report by Sir Edwin Chadwick (the "father of public health in England") on *The Practice of Interment in Towns* published so recently as 1843.

It was not so much the account of the practice of interment as of lack of interment, or delay in interment, that produced the effects. This delay often extended, among the poor, to a week or even two weeks, sometimes from disinclination to part with the body of the deceased but more frequently from inability to collect the funds for the burial, or rather for the social observance accompanying the burial. Meanwhile holes had often to be made in the coffin to drain off the products of decomposition, for there was no such thing as embalming in those days, and not infrequently these juices poured down the shoulders of the bearers—but we would not communicate our stomachic disturbance to the reader, so we forbear further details.

It is good, however, to know that even as regards funerals the world does progress—and as for the living, we doubt whether in England it is now often the case that there are to be found a dozen people living in one room. No wonder that funerals were an expense, for they came so frequently, especially among children, even when they were not in themselves costly.

When we read of one grave being made large enough to hold fifteen hundred persons we can appreciate the horrors of epidemics of the day. No wonder that cemeteries were often a real public nuisance and that it was believed they were a menace to the health of those in the neighborhood. In fact they were more of a menace than we can now appreciate.

Death has a terrible sting and the grave still seems mightily victorious, but a philosophy, less materialistic than we have known, is finding its way into the general consciousness as our ideas of matter and of mind broaden and interlace. After all, we know as much about the future as we do about the past —about the whither as the whence, and the latter deserves as much of confident hope as the other our wonder and respect. No less a light in science than Verworn believed in cell consciousness as well as in the consciousness of organized collection of cells, and who knows but, as Samuel Butler ingeniously suggested, the launching of the ovum on its way to be a human being may be looked upon by it with as much foreboding as the finished (?) and adult product looks forward to its cellular dissolution. Certainly if, as in a reversed, cinematograph picture, our life history were suddenly reversed, we would most assuredly look with dread upon the process of a gradual return to youth, childhood, infancy, and intrauterine existence. At least we do not have that sort of thing to contemplate and we can believe that though this life is good "there is better than it" somehow, somewhere, for, while there is constant change, there seems no such thing in Nature as extinction.

CONSTIPATION

The medical profession is as changeable in its teachings and practice as—well, as a woman. One day it condemns constipation, describes resulting autointoxication and urges the regulation of the bowels by suitable foods rather than drugs. The next day it announces that constipation seldom exists, that there is no such thing as autointoxication and recommends the use of laxatives and enemas instead of right diet.

Perhaps we should not say that this veering, weathercock fashion has taken place in the profession, but in some of the profession—those that accept without reserve the conclusions of Alvarez and Freedlander.

It is a good thing that the medical man is capable of change of mind without notice, provided there is ample cause for change of opinion. "One little fact," to quote Huxley, may easily upset the finest spun theories, and its revolutionary power deserves to be recognized. We question, however, whether the results of any single experiment often, if ever, deserve such recognition, particularly when it is carried out in an unnatural way. Glass beads are not food, no matter how small they may be, and their passage through the alimentary canal can hardly serve as a test of the time taken by real food in its passage. Food of one kind is much longer leaving the stomach than that of another kind and we do not know but that the intestine may also discriminate to an extent in this way. We certainly have no knowledge as to how it should behave toward such foreign bodies.

Whether there is or is not autointoxication from retained food substances in the bowels, these experiments certainly do not prove much nor do they in the least disprove that constipation is the most common and most troublesome of human diseases after

carious teeth. Doubtless too much is made of it by many persons who are too thoughtful of their health or are the victims of the internal bath cult, and it is going rather strong to advise, as appears in one health book, "three movements a day." Life is too short for that sort of thing, but, on the other hand, there must be no putting off of "that inclination," for the consequence, whether from autointoxication or what not, is bad from every point of view, even if it does not lead to hemorrhoids, from which condition deliver us!

There may be no such thing as autointoxication, but we would better make certain of the fact, since we have latterly made so much of it, before kicking it overboard. There is, however, constipation and plenty of it, and most of it can be cured by a return to natural ways of behavior toward the whole alimentary canal, and particularly with regard to considering the evacuation of the bowel, at the appropriate time, as of as much importance as filling it up. In this connection it is most significant that constipation is practically unknown in wild animals in captivity. The activity of such animals is certainly not so great or so varied as it is in the wild state and consequently the food consumption is less. Those who have studied the subject most carefully attribute this healthy state of affairs to the fact that such animals are never overfed, that their food is made approximate in quality to the natural diet, but more especially to the fact that the animals always obey the call for emptying the bowel when that call comes.

FOOD ALLERGENS AND ARTHRITIS

To improper diet, to an inadequate or an excessive diet, or to errors of diet of one kind or another are ascribed many of the ills to which human flesh is heir. Diet has a great influence on the production and exaggeration of the symptoms of many diseases and judicious dietetic treatment will abate these symptoms. There are also certain foods to which certain individuals have idiosyncrasies.

In the *Boston Medical and Surgical Journal,* September 4, 1924, John A. Turnbull discusses food allergens in connection with arthritis, pointing out that it has been known for a long time, that in some persons the eating of certain foods would produce rheumatism, as well as disturbances of a respiratory or dermatological character. For instance, strawberries, red meats or some other foods will produce or are believed to produce rheumatism in those predisposed. Turnbull points out that in some cases this belief is founded on, while in other arthritic cases, the statement is the result of sayings which have become traditional, that red meats and acid fruits will produce arthritis in those having a rheumatic tendency. His experience with anaphylactic disturbances of the respiratory tract, such as vasomotor rhinitis, hay fever, asthma and bronchitis, taught him that many of these cases had associated joint manifestations, and, with the elimination of the offending allergens, the arthritis cleared up.

Turnbull gives an account of four cases which came under his personal observation and which, while the arthritis attacked different parts of the body, were all completely relieved by the elimination of the form of diet to which the patient was hypersensitive.

The following conclusions were drawn: 1. Food allergy is an important factor to be investigated as well as other sources of arthritis. 2. A diet should be worked out for each person, the diet of each depending on his own individual sensitization. 3. By the elimination from the diet of the foods to which these patients were sensitive, the progress of the arthritis was arrested, and they were relieved from the joint pains. 4. Elimination of the food allergens produced changes in the articular and periarticular adhesions, allowing increased movements of the parts, which was a great advantage to the patient.

It has been denied by some authorities that diet plays any part in exciting or aggravating the symptoms of arthritis, and yet examples are numerous in which arthritis is intensified by eating certain foods and relief is experienced by refraining from such foods. Is the arthritis associated with such anaphylactic disturbances as hay fever and asthma of a different type from that which is not thus associated; or are the skin or respiratory complaints associated with arthritis but manifestations together with the arthritis of anaphylactic origin? Is the belief of our fathers that certain foods, and especially strawberries and red meats, excited arthritic or rheumatic symptoms, as they termed them, an altogether mistaken one? There is much yet to be learned with regard to the sensitiveness of individuals to particular foods and a study of arthritis suggests itself in this connection. It is a comparatively untilled field and should yield a bounteous harvest, if assiduously cultivated.

THE OVERWEENING VANITY OF YOUTH

Life is being prolonged and some youthful persons have been dilating recently on the wickedness of such prolongation. It is argued that there is no room nowadays for old or even elderly people and that the health measures which are responsible for lengthening the ordinary span of life considerably are neither for the good of the race nor for the individual, and especially are not for the good of the race. It is said

by these opponents of long life that fifty is a suitable age at which to be cut off, more particularly as in overcrowded lands, in Europe for instance, persons above this age are really cumberers of the ground who make it hard for the younger generation to earn a living.

However, this is a creed thoroughly believed in in this country, where gray hairs are frequently an obstacle to obtaining employment, and where the call of youth is most energetically proclaimed. To some extent, this attitude towards age is a natural attribute of youth and can be understood. Youth possesses the vanity and selfconfidence of ignorance and is likely to be supercilious and sceptical of the value of experience. There is another aspect of the question. Old age is relative, one individual may be old at fifty and another of the same age comparatively young. It is above all a matter of health. If the man or woman of fifty or more is healthy there is still the capacity for work and enjoyment. In some vocations, in that of medicine for instance, experience is of the greatest importance, and it is obviously a false statement that life cannot be enjoyed after the age of fifty. It may be pointed out that many young people suffer from hopeless ill health and many elderly people enjoy splendid health. As long as good health is maintained there is room for the old and elderly. As the country proverb, attributed to an English writer in 1539, puts it, "The young men think that the old men are fools; the old men know that the young men are."

THE VALUE OF CODLIVER OIL

Codliver oil is highly valuable both as a food and as a medicine. During recent years, and especially since foods have been studied scientifically, codliver oil has been reinstated completely in the estimation of the medical profession and the public, and the high esteem in which it was held by the older generation of medical men has been justified entirely by modern research.

While doctors of bygone days knew little of the chemistry of food and were wholly ignorant of vitamines and of the necessity for the presence of these and other constituents of food in more or less proper proportions for the establishment and maintenance of good health, they seem to have arrived by observation at many wise conclusions with regard to diet. What they lacked in accurate and scientific knowledge with respect to drugs and foods they made up by their powers of acute clinical observation which were accentuated and intensified by the teaching and practice of long experience. At any rate they made no mistake concerning codliver oil and their dictums as to its therapeutic and dietetic value are daily being borne out by scientific investigation. For example, one of its beneficial therapeutic effects is its use in the treatment of exophthalmic goitre owing to its minute content of iodine, whereas larger doses of iodides are almost invariably harmful.

This fact was again pointed out in a remarkable article on the effect of iodine on hyperthyroidism in man, by S. J. Cowell and E. Mellanby, which appeared in the October number of the *Quarterly Journal of Medicine*. Of course, its therapeutic action is manifested in many ways. As for the antirachitic properties of codliver oil, which are among its most valuable characteristics, it is pointed out by an editorial writer in the *Medical Press and Circular*, November 26, 1924, that these properties are due to some subtle essence and not to the oil considered as merely so much energy yielding material. This is shown by the fact that its antirachitic properties are inactivated by oxidation.

This writer goes on to demonstrate that recent experiments suggest that more than one form of fat soluble A vitamine may exist. It is important also to note that this vitamine, though inactivated by oxidation, can withstand long exposure to a high temperature. A due supply of vitamine A is doubly needful during the years of growth. A deficiency of it favors the occurrence of tuberculosis, rickets, pellagra, renal calculus and xerophthalmia.

Attention may be further drawn to the fact that, as in the case of the other vitamines, it is incapable of being synthetized by the body, but it can be stored for a considerable time within the tissues.

Codliver oil in many respects should be the most highly cherished remedy in the armamentarium of the physician. It is the most easily digested of fats and on account of its great nutritive qualities may be looked upon more as a food than a drug. And it not only facilitates digestion and augments the blood corpuscles whereby the weight of the body is increased but a stimulus is given to healthy cell formation, which depends, to some extent, upon fat supply. Moreover, it is a valuable expectorant. As said before, however, its remedial and even curative properties hinge mainly on its nutritive effects and the many diseases for which it appears to act as a specific are caused by some deep seated error of assimilation which is removed by its continued use. Hence the slowness of its action in cases of chronic rheumatic arthritis, lupus, psoriasis, and so on. Really, owing to the absorption of food elements not usually finding their way into the lacteals by means of cod liver oil, it nourishes the body independent of its own highly nutritious qualities.

The older generation of medical practitioners prescribed codliver oil somewhat empirically, because

although ignorant of how it acted they knew it exerted good effects in certain forms of disease. Their judgment based upon keen clinical observation has now been shown to be scientifically correct and affords another strong argument why scientific methods should be reinforced by clinical experience. There seems to be a too great tendency nowadays to rely upon laboratory methods and to allow the clinical side of the question to lapse. Knowledge of the practical aspect of disease is, at least, as valuable as the strictly scientific aspect, indeed many good judges hold that clinical experience is of the first importance and that the value of the laboratory is that it supplies a useful, perhaps essential, adjunct.

COPROLOGICAL SIGNS OF COLITIS

A colitis can be detected in a coprological examination by direct evidence given by products of the mucosa such as pus, leucocytes and blood. Mucus does not appear to have the importance generally attributed to it. It is merely a banal sign of irritation of the mucous membrane, and it is only when the mucus is cloudy and containing many cells and leucocytes that it is an indication of a deep seated lesion.

More importance is to be given to what Goiffon calls mucoid piles. In stools diluted in a mortar and examined microscopically, these appear as small coherent viscous masses having hardly any consistency and easily broken up with a needle. They often occur in mucous colitides in which the presence of real mucus is most uncommon.

Dissolved albumen, often transformed into albumoses, is an important evidence of colitis and can readily be discovered by the acetic sublimate reagent of Triboulet. These albumoses are not derived from food, but are secreted by the walls of the intestine, hence revealing a morbid change in them.

Diarrhea may be due to a too rapid evacuation of the feces without any lesion of the intestinal mucosa. In these circumstances the stools may contain cellulose, starch and other materials, which indicate an incomplete digestion. On the other hand, the liquid stools may be homogenous, giving a dry residue in lesser amount than normally and contain no product of the digestion. These are stools that have remained in the intestine for a time sufficiently long for digestion to be complete, while the excess of water is evidence of colonic hypersecretion which is generally seated on the left. This pseudodiarrhea may be homogenous, that is to say, perfectly fluid. It may be composed of both solid and liquid matter.

The organic acids are derived from fermentation of the carbohydrates of the food and they increase in direct ratio to the fermentation, but their increase does not of necessity indicate the existence of a lesion of the mucosa. On the other hand, when the organic acids are in lesser amount than normal, it indicates a cessation of fermentation resulting from alkaline hypersecretion or early fermentation going on in the right colon. In both cases a colitis exists. Ammonia is a residue of putrefaction. Unfortunately, it is too readily absorbed by the mucosa, which greatly reduces the value of its doses in the stools. In the microbic intestinal flora, the presence of many spirillæ and blastocytes is evidence of colitis, while the presence of numerous cysts of entameba coli may lead one to presume that colitis exists.

Another sign of colitis, according to Goiffon, is the presence of starch, which can be stained blue in a well formed stool and appearing to have been perfectly digested. Hypersecretion of the right colon —a sign of colitis—prematurely arrests digestion of starch by alkalifying the contents of the cecum.

INFANT WELFARE

For the second quarter of this year, the Registrar-General for England and Wales showed in his return of vital statistics that the infantile death rate was sixty-six per thousand, or eighteen per thousand below the average. This is the lowest infantile death rate ever recorded in England in any second quarter. On the other hand, the statistics revealed a decrease in the number of births during the same period, and as a matter of fact, with any second quarter recorded previously except during the war. In spite of the decrease in the number of births, the population increased by eighty-three thousand, that is, two thousand five hundred more than the increase during the second quarter of 1922.

No doubt the cool weather, the absence of flies and the fact that there was no infectious disease had a great deal to do with this result, but probably the main cause was the work done by the welfare centres throughout the country. The education of the mothers in the art of rearing children has been a very influential factor. There are now in England more than two thousand welfare centres, and the decrease in the death rate has coincided with their establishment. At the beginning of the century there were no such centres, and infants then died at the rate of over one hundred and fifty per thousand. Although this is a vast improvement, two outstanding problems, however, remain to be solved, one, the preponderating death rate of infants during the first month of life, the neonatal period, and the other, the heavier death rate of male infants as compared with female infants. More male are born than female infants, but death takes a heavier toll of the males during infancy and throughout life.

Recently tables published by American insurance companies tend to question the female mortality as evidenced by these tables. But, in a general way throughout the world, the female is longer lived than the male. The reduction of the neomortality would seem to be a problem of the care of maternity, the reduction of the male infant mortality a problem of scientific motherhood. Of course, both are branches of infant welfare.

Indeed the care of the expectant mother is perhaps the most important phase of infant welfare. This question was most carefully considered and discussed at the Infant Welfare Conference held in London a short time ago. The need for maternity homes in all parts of the country was insisted upon. Sir George Newman, Chief Medical Adviser to the British Ministry of Health, in a memorandum published recently, also laid particular stress on the same point, and Dr. Rhoda Adamson at the Infant Welfare Conference discussing the Maternity Resolution of the Washington Convention, 1919, pointed out among other things that the birth of children may be considered from two entirely different points of view.

First, it may be considered to be an entirely family matter brought about to satisfy the desire for a family by the partners in a happy marriage. Second, it may be looked upon as a duty to the State undertaken by certain individuals and not by others. Of course in actual practice both points of view come into consideration. While many children are born because their parents want them, and are able and anxious to care for them, the State has need of every child born into the country and it is argued should take responsibility for it when the parents are either unable or unwilling to care for it. Obviously of the two parents the mother has the more immediate influence upon the health of her unborn and newly born child than the father.

If the mother is overworked and underfed she becomes weak and anemic and the child is born handicapped by a lowered vitality. After birth, too, she is not in a sufficiently good physical condition to nurse and rear her child properly. It is patent that for an infant to be born under favorable conditions the expectant mother must be well nourished both in body and mind, that the mind should be at ease is hardly of less consequence than that the body should be in good condition. Now these essentials are not possible if the mother has to work and worry while pregnant and does not get enough proper food. In many cases the expectant mother has to undergo these drawbacks with the result that the infant is handicapped from its very birth. This is contrary to the best interests of the individual, society and the State and it would seem that it is to the advantage of all that the State should take the responsibility of caring for mother and child. Moreover, every expectant mother should have the care of a properly trained obstetrical attendant during her pregnancy, labor and lying-in period. If this were so there would be fewer cases of stillbirth and damage to the child at birth and less burden of ill health during expectant motherhood and danger to life and health resulting from want of care during labor.

This adequate skill and care should not be a question of money but of the condition calling for it. Naturally payment for leisure from industrial work and paying for adequate maternity care cost much money. But according to the arguments of a large section of the medical profession and of the public money thus spent will be money well spent as it will be very much less costly in the long run than the continued responsibility by a country for damaged and badly developed children grown to maturity. The good health of its population is the greatest asset of a nation, and for adults to be healthy they must be born and reared under favorable conditions. Infant welfare efforts have been attended with great success so far and if extended wisely in the directions pointed out should have proportionately greater success.

SEMIANNUAL INDEX

The index to Volume CXX of the MEDICAL JOURNAL AND RECORD, July to December, 1924, is now ready for distribution. Readers who desire a copy of this index may receive it on request.

News Items.

Goitre Survey.—The state department of health of Illinois is endeavoring to work out a practical plan for a goitre survey of the state.

Intern Appointments.—An agreement has been reached by fifty-eight of the Philadelphia hospitals to make no arrangements for appointment of interns before February first of the student's senior year.

Industrial Hygiene Survey.—The Philadelphia Health Council and Tuberculosis Committee has completed a study of the extent of industrial health service in that city.

New Cottage at Trudeau Sanatorium.—A cottage for women who have incipient tuberculosis has been built at Trudeau Sanatorium, as a memorial to Arthur and Susan Gillender.

Research in Anemia.—An endowment of $400,000 has been received by the University of Michigan, through the generosity of Mrs. Christine MacDonald Simpson, to be devoted to research in pernicious anemia.

Gift to Institute for Crippled and Disabled Men.—Announcement is made of a gift of $200,000 from Jeremiah Milbank to the Institute for Crippled and Disabled Men, the income to be used in industrial training.

Pasteur Memorial.—Dr. Frank Billings, of Chicago, is chairman of a committee working to raise a fund of $100,000 for a monument to Pasteur, to be erected in Chicago, and a research scholarship, open to all American students.

Memorial to Dr. Southard.—A bronze tablet, designed by Bashka Paeff, has been placed in the Boston Psychopathic Hospital, in memory of Dr. Elmer Ernest Southard, the founder and first director of the hospital. Dr. Southard died in 1920.

Harvard Medical Dormitory.—Dr. Francis M. Rackemann is secretary of the executive committee of the Harvard Medical School Dormitory Fund, which is endeavoring to raise funds for a new dormitory. The sum of $250,000 has already been raised.

Coast Water Pollution.—Mr. D. M. Neuberger, of New York, president of the National Coast Antipollution League, is endeavoring to have legislation passed safeguarding the navigable waters around the city from pollution, by land plants as well as floating craft. At present naval vessels and vessels of the shipping board are excepted in the law.

Extension Medical Work.—The alumni of the University of Georgia Medical Department are planning to give a series of extension courses on internal medicine, physical diagnosis, pediatrics, and sanitation, in cooperation with the various county medical societies. The courses will be given in localities where there is clinical material available, and will be open to all physicians; the expense will be borne by the university.

Civil Service Examinations.—Examinations will be held in Washington, Chicago, New Orleans, and San Francisco, on March 2d, for entrance to the regular corps of the U. S. Public Health Service. Candidates must be between the ages of twenty-three and thirty-two, graduates from a reputable medical school, and must have had one year's hospital or two years' professional experience. Details should be obtained from the Surgeon General of the U. S. Public Health Service.

Examinations will be held beginning February 18th, for physiotherapy aide, physiotherapy pupil aide, and physiotherapy assistant, for vacancies in the U. S. Veterans' Bureau. Details should be secured from the U. S. Civil Service Commission.

Hospital News.—The four-story fireproof building at the corner of Twenty-first Street and Second Avenue, recently acquired by the New York Post-Graduate Medical School and Hospital, will be formally dedicated to its new use at 4:30 on the afternoon of Thursday, January 22nd. Among the speakers will be Dr. Livingston Farrand, president of Cornell University; Rear Admiral E. R. Stitt, chief of the Bureau of Medicine and Surgery; Dr. Augustus S. Downing, first assistant commissioner of education and director of professional education of the State of New York; and Dr. Henry Dwight Chapin, for many years a member of the Board of Directors of this institution.

The first contracts in connection with the construction of the new Columbia Presbyterian Medical Centre have been awarded to Post & McCord for the steel work of the new Presbyterian Hospital and the new building to house the College of Physicians and Surgeons. The contract also includes the Presbyterian Hospital private patient pavilion. The combined cost of the Hospital and Medical School building has been fixed at $10,000.000. This is the first of the group of hospital and school buildings to be erected on the twenty-acre site of land at 168th Street overlooking the Hudson River.

Society News.—At the meeting of the American Stomatological Association, to be held February fifth, 8:30 p.m., at 50 West Eighty-eighth Street, Dr. Samuel I. McCullagh will speak on "Rhinology in Relation to Stomatology, with Special Reference to Chronic Antral Infections." Discussion will be by Dr. Louis A. Coffin, Dr. Edward S. Pope, and Dr. Ferdearle J. Fischer.

The Medical Society of the County of Kings elected the following officers for 1925 at its annual meeting held December 16th: Dr. John E. Jennings, president; Dr. O. Paul Humpstone, vice-president; Dr. Thomas M. Brennan, secretary; Dr. James Steele, associate secretary; Dr. Charles H. Goodrich, treasurer; Dr. Eliot Bishop, associate treasurer; Dr. William Browning, directing librarian; Dr. Jacques C. Rushmore, associate directing librarian and curator; Dr. Charles A. Gordon, trustee; Dr. Henry Joachim, Dr William V. Pascual, Dr. Robert F. Barber, Dr. Thurston S. Welton and Dr. Howard T. Langworthy, censors. The following delegates to the Medical Society of the State of New York were elected for a term of two years: Dr. Edwin A. Griffin, Dr. Charles E. Scofield, Dr. Claude G. Crane, Dr. Henry Joachim, Dr. John J. Masterson, Dr. George D. Hamlin, Dr. Russell S. Fowler, Dr. Roger Durham, Dr. John J. A. O'Reilly, Dr. Harry H. Patrie, Dr. Charles A. Gordon and Dr. Richard A. Henderson.

Personal.—Dr. Norman E. Titus has been appointed associate in surgery at Columbia University, to have charge of the physiotherapy instruction.

Dr. Philip Ingram Nash was the guest of honor at a banquet in recognition of his effective civic activities.

Dr. Seth R. Sprague is the new chief of the orthopedic clinic of the Jersey City Hospital, succeeding the late Dr. Henry Bogardus.

Dr. Abraham Strachstein, retiring president of the Eastern Medical Society, was the guest of honor at a dinner at the Hotel Commodore. He was presented a gold watch in recognition of his services. The incoming president, Dr. Nathan Ratnoff, acted as toastmaster.

Dr. Charles H. Mayo, of the Mayo Clinic, has endowed a lectureship in surgery at Northwestern University Medical School, Chicago.

Dr. George W. Alexander, of Gardiner, Maine, has been appointed a member of the state public health council, succeeding the late Dr. Frank N. Whittier.

Dr. Alfred Worcester, of Waltham, Massachusetts, a former president of the Massachusetts Medical Society, was the guest of honor at a testimonial dinner.

Dr. Arthur C. Bachmeyer, superintendent of Cincinnati General Hospital, has been appointed dean of the University of Cincinnati College of Medicine, succeeding Dr. Henry Page—effective next September. Dr. Bachmeyer is president elect of the American Hospital Association.

Dr. George E. de Schweinitz, of Philadelphia, has been elected a trustee of the University of Pennsylvania.

Dr. Alexander M. Burgess of Providence has been appointed medical director to Brown University.

Dr. E. D. Friedman, who is attached to the staff at Bellevue and Mt. Sinai hospitals, has been appointed clinical professor of neurology in the Medical Department of New York University.

A testimonial dinner was tendered to Dr. L. Duncan Bulkley, on Monday evening, January 12, 1925, at the Hotel Astor, to commemorate his eightieth birthday and fifty-six years of the practice of medicine.

Dr. Harvey C. Hullinger, of Vernal, Utah, celebrated on December 2, 1924, his hundredth birthday. Dr. Hullinger is still in practice.

Dr. Alice Hamilton, of Harvard University Medical School, has been appointed a member of the health committee of the League of Nations. Dr. Hamilton has recently returned to this country from a study of health conditions in Russia.

Dr. George A. Wingate, of Brooklyn, and Dr. Thomas W. Salmon and Dr. Henry A. Cotton, of New York, have been appointed by the U. S. Veterans' Bureau to select a site for a neuropsychiatric hospital to be built in the district of New York, New Jersey, and Connecticut.

Dr. Hugh J. Morgan, of Baltimore, who has been on the staff of Johns Hopkins Hospital, has been appointed associate professor of medicine at Vanderbilt University Medical School.

Dr. Jacob C. Price, director of the state board of health of New Jersey, has resigned on account of ill health, and Dr. Henry B. Costill, of Trenton, has been appointed his successor.

Dr. Solomon Metz Miller, for many years chief resident physicians of the men's division of the Norristown State Hospital for the Insane, Norristown, Pennsylvania, has been appointed superintendent.

Dr. Mabel E. Elliott has been appointed to the staff of the Woman's Medical College Hospital, of Philadelphia. Dr. Elliott was for several years director of American Relief Work in in the Near East and Caucasian Russia.

Dr. Coleman B. Ransone has become health officer of Roanoke, Virginia, resigning from his position as head of the department of health of Newport News.

Dr. John E. MacKenty, of New York, discussed the subject of artificial larynges at a recent meeting of the Otolaryngological Section of the Baltimore City Medical Society, presenting four patients for whom the appliance had been made.

Dr. Jacob Sobel, of New York, has been appointed assistant attending pediatrist to the Metropolitan Hospital.

Dr. J. L. McElroy has resigned as superintendent of the Ancker Hospital of St. Paul, Minnesota, and will become superintendent of St. Mark's Hospital, New York.

Dr. Frederic W. Bancroft, of New York, has been appointed surgical director of Lincoln Hospital.

Foreign Correspondence

LONDON LETTER

(From our own correspondent)

London, *December 2, 1924.*

ANNUAL REPORT OF LONDON COUNTY COUNCIL

Sir William Hamer, Medical Officer of Health for the County of London, states in the annual report of the London County Council that the deaths from tuberculosis of the respiratory system in London during 1923 numbered 4,432, giving a death rate of 0.9 in a thousand. Deaths from other forms of tuberculosis numbered 553, as against 936 in the previous year. The decrease in the tuberculosis death rate in 1923 is considerable, and indeed is greater than in any year since 1910, if the abnormal years of the war period be excluded. An analysis of the age distribution of deaths from phthisis indicates a decrease which is most marked at the principal ages of influenza mortality; the inference is drawn that the decline in phthisis mortality must be ascribed at least in part to the absence of any epidemic prevalence of influenza in 1923. The number of notifications of tuberculosis in London during 1923 was 12,175, as against 11,548 in 1922. Reference is made to a paper by Dr. L. I. Dublin, statistician to the Metropolitan Life Insurance Company of New York, on the causes of the decline of tuberculosis, analyzing the evidence in support of two distinct theories. The first theory emphasizes more especially the importance of environmental factors in the causation of tuberculosis; the second emphasizes the importance of stock and ascribes the decline to changes in the germ plasm of nations and of races. Of these two explanations the first is believed by Dublin to be the true one. A most interesting and suggestive part of Sir William Hamer's report is that in which he discusses encephalitis lethargica. With Crookshank and others he does not believe that it is a specific disease but summarizes the evidence in favor of the identity of encephalitis lethargica with influenza.

The number of cases of tuberculous children who were under treatment on December 31, 1923, was 707, and the total number treated during the year was 1,404. In addition to the provision for treatment of tuberculous children in residential institutions, the council continued the use of five open air schools. A summary is given of the results of the inquiry conducted by Dr. Bardswell as to the after histories of adult tuberculous patients in the County of London who received institutional treatment during the year. This inquiry has confirmed the existing impression as to the usefulness of the sanatorium in the treatment of tuberculosis in its initial stages, and of its ineffectiveness when the disease is well established. According to the report, there appears to be no doubt that the patient's home environment, his housing, work, habits, temperament and standards of living determine the consumptive's future to a much greater degree than does his period of sanatorium treatment. Under the conditions to which many, indeed the majority, of London patients return on leaving a sanatorium, well established tuberculous disease of the lung is rarely to be cured. Successfully to withstand conditions so unfavorable, tuberculosis must needs be arrested more completely than is possible during a stay of a few months in a sanatorium. A year's continued sanatorium treatment might make more difference. Even then, in many cases, one would expect bad home conditions to be the decisive factor in ultimate failure.

CONGRESS OF THE ROYAL SANITARY INSTITUTE

The next Congress of the Royal Sanitary Institute and Health Exhibition will be held in Edinburgh from July 20 to 25, 1925, by invitation of the Magistrates and City Council.

MEDICAL REPRESENTATIVES IN PARLIAMENT

Twelve members of the medical profession have been elected as members of Parliament. Three of these are in general practice, three represent universities, and the remaining six have given up medicine. Seven are Conservatives, four Labor, and one Independent.

PERSONAL ASPECTS OF PREVENTIVE MEDICINE

Sir George Newman, chief medical officer of the Ministry of Health and of the Board of Education, has written and issued recently a report dealing with public education in health. Discussing the personal aspect of preventive medicine, he points out that a great cause of sickness is digestive disturbance, which is frequently due to errors of diet. Many an individual compels his stomach to work overtime, at irregular intervals and at inordinate speed; or he consumes ill balanced, monotonous mixtures of indigestible food: the real needs of the organism he makes subservient to demands of convenience, habit or fashion. Even if he tries to eat the right thing at the right time, he does not know that milk, butter, vegetables, fruits and numerous other foods are preserved, colored or adorned by the addition of substances which may be harmless, but, on the other hand, may be definitely injurious. Even flour may have a large amount of its valuable nutrient removed, and be treated with various undesirable chemicals to make it white and pleasing to the eye. Knowledge of food values and the needs of the body is lacking, with the result that much money is spent on unsuitable food, while many valuable and cheap foods are almost entirely neglected. Only by teaching individuals, what, when and how to cook and eat, and how to protect their food from contamination, can the digestive system be ensured of the respectful and considerate treatment that will enable it efficiently to fulfill its function. The diet should be as far as practicable sufficient, varied, nutritive and digestible. Overeating and overdrinking and swallowing food without proper mastication should be avoided. On the whole, Sir George Newman thinks that there are grounds for believing that there is no single subject of more importance to personal and national health, or more crying out for educational treatment than this one of the proper use and control of food. According to Professor McCollum, of Johns Hopkins University, the chief factor re-

sponsible for human deterioration in recent times is the unwise choice of food. Much can be achieved through dietary reform.

The crippling of children by rickets or bone tuberculosis are other conditions of ill health referred to. It is pointed out that the first of these is now known to be preventible, and is due almost entirely to faulty feeding and rearing in the early years of life. It is likewise known that it cannot be prevented without correct feeding, sunlight and fresh air. Bone tuberculosis, even after the disease has appeared, can to a great extent be prevented from crippling its subject if early and appropriate treatment is given.

Sir George Newman particularizes ten types of conditions or disease which lead to chronic ill health, crippling or death, and which are responsible for the greater part of the mortality and suffering of civilized life, and which, as he insists, for their remedy demand personal knowledge and personal practice. He emphasizes the fact that in the existing situation only an educated people is an effective people. It may be further added that in the existing situation in all parts of the civilized world this statement applies with equal force. Moreover, it is the women and mothers who chiefly need education with regard to diet for it is women who have the care of the children.

VIENNA LETTER

(*From our own correspondent*)

VIENNA, *December 2, 1924.*

THE DISCOVERY OF CANCER PRODUCING BACTERIA

The Society for the Study of Digestive and Metabolism Diseases in Berlin held a conference the last of October. In the session on the twenty-third, Dr. Ferdinand Blumenthal, secret councillor, reported that he had succeeded in discovering the causal agents, that is, the bacteria of cancer, which have the power of producing cancer in an animal. He made pure cultures from bacilli derived from human cancer, and with these produced cancerous growths in animals, which growths are propagating on the same kind of animals and which ulcerate and which are equal to the cancer growths, biologically as well as histologically. Up to the present he had succeeded in cultivating two different growths, up to the ninth generation. In order that the growth shall develop, it was necessary to give a stimulating preparation. This fact shows that beside the inner disposition an external stimulus is necessary to cooperate in the production of cancer. Blumenthal is modest enough to confess that he did not discover the causative agent of cancer, but only a group of cancer producing bacteria.

WASSERMANN ON THE DIAGNOSTICS OF CANCER

At the same meeting Professor Wassermann, secret councillor, gave a lecture on the diagnosis of malignant tumors. He started out from the fact that there is one specific causal agent, which is capable of producing specific changes in the blood. Experiments had been made to discover these agents which produce cancer, but up to the present it had been only possible to state that cancer was caused by parasites, but on the other hand that it could occur without these. By reason of this serodiagnosis is impossible from a bacteriological viewpoint. Otherwise it would be possible to make specific reactions as is the case with syphilis, with the assumption that cancer cases behave, from a biological and biochemical point of view, differently as the body cells. In order to answer the question of difference let us reflect that the fetus in the womb of the mother is biologically a special individual, and from this fact it can be concluded that the cancer cells also behave differently from the cells of the host. Up to now, however, it was possible to verify quantitative differences, but not qualitative ones. Professor Wassermann believes that in the near future he will succeed in confirming such differences, too, so that there will be a prospect of building up the diagnosis and therapy of cancer.

ULTRAVIOLET RAYS IN LARYNGEAL TUBERCULOSIS

The recent meeting of the medical society was opened with a memorial speech by Professor Maresch to the late Professor Paltauf. Afterwards Professor Hajek and his assistant, Dr. Wessely, spoke about the actinic therapy of the diseases of the upper air passages. Tuberculosis of the larynx was first described by Vienna doctors, namely, Stork and Schrötter. This very serious disease was first treated surgically, but the unsatisfactory results achieved by this method have compelled the laryngologists to consider other methods. They tried to heal the small ulcers by burning them with galvanocaustic. Later on the inhalation treatment with antiseptic sprays was resorted to, but the result was no better. Also the blowing in of iodine and iodoform was tried. As all these procedures were of no avail, the ulcers were cauterized with lactic acid. In 1908 Professor Sorgo succeeded in inventing a device which made possible the direct application of sun's rays into the larynx. He taught his patients to reflect the sun's rays with the aid of a laryngoscope upon the larynx itself, and he succeeded in getting good results with this simple method. In the Vienna clinics, for diseases of the air passages an apparatus has been used since 1920, which produces the ultraviolet rays in a great quantity in order to cure tuberculosis of the larynx. With this simple method excellent results have been attained and Professor Hajek said that he felt encouraged to recommend this method for all cases of tuberculosis of the larynx, as the best one at present.

THE VIENNA HYGIENE EXHIBITION

The Health Board of the Austrian state, in conjunction with the Board of Health of the City of Vienna, established an exhibition, comprising all that pertains to the hygiene of the individual and of society, that is to say, the community. A special importance attaches to the fact that the exhibition has been enriched by the abundant collection of hygienic matters which were exhibited in Dresden in 1911 in the vast exposition, called, *Der Mensch*. This collection embraced all articles pertaining to personal and general hygiene. On all these subjects lectures were held and free booklets were distributed. Explanatory films were shown and special courses were held on eugenics.

LATIN AMERICA LETTER

(From our own correspondent)

Balboa Heights, Canal Zone, *December 12, 1924.*

YELLOW FEVER SITUATION IN CENTRAL AMERICA

Dr. Henry Hanson of the Rockefeller Foundation recently passed through the Canal Zone on his way to Colombia, where he will continue the direction of the sanitary campaign which he has been conducting for many months. His work in Colombia was interrupted some time ago by the outbreak of yellow fever in San Salvador. Since July, he has been carrying on a campaign against yellow fever in that city. During a recent conference with the Chief Quarantine Officer of the Canal Zone, Dr. Hanson said that since the first case of yellow fever in San Salvador in June there have occurred eighty cases with thirty deaths. He saw thirty of the cases and was present at seven autopsies. In the hotel at which he stayed five Americans were taken with the disease. Among these was Mr. L. H. Dunn, one of Dr. Hanson's staff. He had previously been inoculated with the Noguchi serum for yellow fever, but contracted the disease before immunity had been successfully established. The entire American colony has been immunized with this serum. No new case of the disease has been reported since November 14, 1924. Dr. Hanson says that although the epidemic seems to have been controlled and the campaign is actively continuing, the survey has not yet been concluded upon which data could be based for estimating eradication of the infection. Ahuachapan, El Salvador, also reports the disease.

Just at the time it was thought that yellow fever was being eradicated from the Central American states a report was received to the effect that it had broken out in the Stann Creek district of British Honduras. A quarantine embargo against ports of British Honduras has been issued.

WAR ON CHIROPRACTORS IN COLON

Medical practitioners in the City of Colon have complained to the Mayor of the increasing number of chiropractors who, they say, not only employ their own methods but enter the realms of practical medicine, although not qualified either by license, experience or study to do so. The physicians ask that if these men desire to practice modern medicine they first pass an examination before the National Board of Hygiene. Prior to taking action on the matter, it was submitted by the Mayor to the National Board. In reply, the chairman of the board quoted Article 20, Law 18, of April 6, 1904, which specifies that any person desirous of practising medicine or surgery in any of its branches must first pass an examination before the board in the manner and form it may prescribe. The Mayor therefore dictated a resolution to the effect that all chiropractors doing business in the city of Colon must appear before him and be notified that before practising further they must take an examination before the National Board of Hygiene, and pending the result of such examination, must remove all signs and other business announcements from their offices. In case the applicant passes the examination he will be so notified and permitted to continue his practice.

PANAMA SCHOOLS CLOSE ON ACCOUNT OF INFLUENZA

All schools in the City of Panama were ordered closed in November due to the alarming increase of influenza cases among the residents of Panama, and as a means of preventing the further spread of the disease. In the Canal Zone the disease is on the wane but a few weeks previously the schools were almost depleted. The order closing the schools in Panama was issued by the Acting Inspector of the Panama Schools, who addressed a circular letter to all principals. They will remain closed until the epidemic abates. The schools of the Zone were not closed because the Health Department believes that better control can be effected when the children are in school.

SERVIA HONORS TO FORMER CANAL ZONE SANITARIANS

Dr. Luis de la Pena and Mr. Otis Campbell, two former sanitary inspectors of the Canal Zone during the construction days, were recently decorated by the King of Servia in recognition of their services several years ago with the American Red Cross during a campaign against typhus fever in that country. They were decorated with the Order of Saint Sava. Mr. de la Pena lost his life a short time ago in Nicaragua, where he was carrying on a sanitary campaign. Both of these men worked directly under General Gorgas during construction days and later Mr. Campbell left to engage in sanitary work in several South American countries. To receive the order of Saint Sava is an honor of the highest sort. In Servian history, Prince Rastko, the youngest son of Stephen Nemanya, who in the early part of the twelfth century united all the Serb countries under his rule, secretly left his father's court and entered the famous Monastery of Mount Athos. He became a monk, discarded his paternal name, and was known as Sava. St. Sava became the first Archbishop of Servia, established eight bishoprics, and encouraged schools of learning. He is the patron saint and protector of education among the Serbs.

ROCKEFELLER FOUNDATION ACTIVITIES IN CENTRAL AMERICA

A commission composed of Dr. M. E. Connor, Dr. Henry Beeuwkes, and Dr. Henry Muller have started a sanitary survey in Mexico and all Central American countries except Costa Rica, looking toward the banishment of the transmitter of yellow fever, the stegomyia. With the sanitarians, a large staff will make the survey and later will inaugurate an active campaign against the yellow fever mosquito.

HEALTH RADIO LECTURES

The National Health Department of Argentina began in July last the broadcasting by radio of brief talks on subjects related to health; stations LOX and LOZ are being offered for that purpose by the Argentine Association of Radio Culture. The subject matter of these lectures covers a wide field and is directed largely at the improvement of child welfare, the protection of children against tuberculosis, the care of people's mouths, colds and other pulmonary diseases, quackery in the treatment of tuberculosis, the prevention of trachoma, the prophylaxis of syphilis and many other questions of personal hygiene receiving appropriate attention.

Letters to the Editor.

THE CAUSATION OF CANCER

London, *December 1, 1924.*

To the Editor:

I have read your very kindly and rather extensive review of my book *Cancer: How It Is Caused, How It Can Be Prevented,* in your issue of November 19th. While acknowledging that my book ought to do a great deal of good by urging simpler, more natural and more biological living, and while admitting that the reforms advocated by me "will ward off many diseases, perhaps, including cancer," there is a tone of doubt as to whether my analysis of the cancer causes is correct or not. You will therefore be interested in learning that my theory that the disease is due to chronic poisoning and vitamine starvation has received ample confirmation since the time when it was put forward.

Numerous medical men have written to me from far away countries endorsing my view that cancer is a disease of civilization and is practically unknown among primitive races leading primitive lives. The most striking confirmation came to me from Colonel Hallilay, of the Indian Medical Service, who informed me that he had worked during more than twenty years among the Hill tribes of the Himaylayas, that he had performed thousands of operations among the natives who readily and gladly submit to surgical treatment, that he had performed no less than seven hundred operations for stone of the bladder, but that he had performed not a single operation for cancer during all that time, except on Anglo-Indians and on the Europeanized natives of the plain. That is surely a most remarkable fact, to which I would draw the attention of all cancer researchers.

Cancer is obviously a disease of civilization and of luxury. Therefore it is most frequent in the wealthiest districts of England and the United States. In England cancer is least frequent among the very poorly paid agricultural laborers, gardeners and clergymen, who not only have a very sparing diet but are physically very active. Overfeeding and inactivity combined lead to congestion, constipation, autointoxication, gout and a host of diseases. Protein poisoning, due to the wrong teaching of Liebig, is universal among well to do populations. Lately the British Government has published statistics relating to the mental hospitals. They show that the cancer mortality in these institutions is only three per cent., while in England and Wales it is no less than 12.4 per cent. This tremendous disproportion is all the more remarkable as the mental hospitals, with a population of about one hundred thousand, contain few children. Feeding in these institutions is exceedingly plain. Many similar facts might be given, but I do not wish to weary your readers.

A few days ago an acquaintance of mine visited me and told me that he had read my book but that in the case of his wife, who had died a few months ago from cancer, there was no indication of chronic poisoning and vitamine starvation. She had had a regular evacuation every morning, though she sometimes took pills, and she had led a perfectly normal life. A few questions on my part led to the admission that the lady took meat three times a day, that she lived on concentrated and very rich food, that she took practically no exercise, and that the place of retirement was filled with a pestilential smell after she had been there. Obviously the lady suffered from disguised constipation. She had an evacuation every day but the remainders of a dozen meat meals or more were habitually putrefying in her bowels.

I did not mention the important factor of mineral salts in my book and I think I shall make good that omission in the fifth edition which will be required before long. I am well aware of the supreme importance of mineral salts and I know that mineral salts deficiency leads to a great number of diseases. However, I am not satisfied that it is one of the causes of cancer, although the weakening caused by mineral salts starvation may have something to do with it. However, mineral salts and vitamines go together. Refined flour and overcooked vegetables, refined sugar, etc., are deprived of both the vitamines and mineral salts. As I have advocated the use of wholemeal bread, of raw fruits and salads, of conservatively cooked, which means steamed, vegetables and of sugar in its natural condition, I have urged both the high consumption of vitamines and of mineral salts.

J. Ellis Barker.

DOSES FOR CHILDREN

New Haven, Conn., *December 22, 1924.*

To the Editor:

The article by Dr. A. D. Bush on Doses for Children, in the December 17, 1924, number of your Journal adds one more suggestion to the many as to the determination of the proper dose of a drug for a child. He apparently is not familiar with my rule, which to me is the simplest that was ever propounded. I first published this rule about twenty-five years ago, but it appears on page thirty-eight of my book, *Principles of Therapeutics* (1921), with which book Dr. Bush is apparently not familiar.

Of course the most accurate method of determining the dose for a child is its weight. A large child of three years, for instance, will take the dose of a small child of five years.

My rule is as follows, the adult dose being considered at twenty years and upwards:

At twenty years the adult dose.
At ten years, one half the age, one half the dose.
At five years, one quarter the age, one quarter the dose.
At two and a half years, one eighth the age, one eighth the dose.
At one year, one twelfth the age, one twelfth the dose.

If the child's age is between the ages given in the table, a little more or a little less, as the case may be, than the dose called for at the age in the table nearest the child's age will be the dose.

The advantage of this dose table is that it is so simple and so easy to compute. It is correct for determining the dose of all drugs except narcotics. To quote from my book, page 38: "The child's brain and central nervous system are relatively larger to its weight than in the adult, hence drugs that act strongly on the brain should be given in smaller doses than the above table would indicate."

This letter is not meant to criticize Dr. Bush for his omission of my suggestion, but to suggest the most simple rule to determine doses.

Oliver T. Osborne.

Book Reviews

OBESITY

The Cure of Obesity. By Doctor Jean Frumasan. Translated from the French by Elaine A. Wood. New York: William Wood and Company, 1924.

This little book of 124 pages describes the author's procedure in the treatment of the obese. The technic, briefly summarized, is as follows: 1. Purging, to overcome the ever present "intoxication." 2. Fasting for five to ten days to be terminated on the appearance of "true" hunger. During this period the patient is to wear a firm abdominal belt to aid in maintaining the tone and position of the viscera. He is also to receive hydroelectric baths with the current directed through the intestines, liver and stomach; as well as iodized ionization localized over the prominent fat masses of the body (abdomen, hips, back, legs and arms). If we are to take the author literally such fat deposits proceed to melt away rapidly under this treatment. 3. Diet, based on the principle of progressively increasing, sufficient alimentation. During this stage the patient receives intensified physical culture and abdominal massage.

The general plan of therapy seems sound and the remarks on diet appear sensible. It is hard to imagine how such long periods of fasting as those recommended could be accepted by any large number of obese subjects, unless these were under the dominance of an impressive personality. If the electrical results obtained are as startling as is asserted they should soon be confirmed by other workers in this field.

The book is apparently written for the laity, it is difficult to see to what purpose. It should, however, form stimulating reading to physicians, as it is obviously a sincere and courageous effort to popularize a new and fundamental line of therapy for a widespread affliction. Such an end—legitimate medical popularity—would be best furthered in our opinion by a medical rather than by a lay translator, inasmuch as the book shows repeated evidence of unfamiliarity with exact English medical equivalents.

The glossary is carelessly edited.

Uber Wesen und Behandlung der Fettsucht. Von Prof. Dr. S. Isaac, Gegründet von Prof. Dr. Joh. Müller in Nürnberg und Prof. Dr. Otto Seifert in Würzburg. Neue Folge herausgegeben von Prof. Dr. E. Magnus-Alsleben in Würzburg. Neue Folge, Band I. Heft 6. Der Ganzen Reihe 21. Band. Leipzig: Verlag von Curt Kabitzsch, 1924. Pp. 155-188.

In these days of the quest for the "boyish" form, especially on the part of the female sex, a monograph on the nature and treatment of obesity seems to be in order. Two types of obesity are distinguished—exogenic and endogenic. After discussing the metabolic disturbances occurring in obesity, the part played by the endocrine glands (thyroid, genital, hypophyseal, epiphysis, adrenal cortex and thymus) in the pathogenesis is taken up. The treatment includes general dietary regulations and also special types of diet, muscle work, hydrotherapy, courses at watering places, thyroid therapy, operations on hypophyseal tumors, x rays and, possibly, antiluetic treatment.

Nebenwirkungen der modernen Arzneimittel. Erster Nachtrag zur zweiten Auflage des Hauptwerkes von 1923. Von Prof. Dr. Otto Seifert in Würzburg. Neue Folge, Band I. Heft 7. Der ganzen Reihe 21. Band. Leipzig: Verlag von Curt Kabitzsch, 1924. Pp. 189-215.

The most recent therapeutic remedies and their indications are described, including their dosage and byeffects. The bibliography of each remedy is appended. The preparations are mostly of German manufacture and the vast majority of them have not been in use for a sufficient length of time to warrant their adoption. The names of the manufacturers are also given.

DISEASES OF THE HEART

Diseases of the Heart. By Dr. Henri Vaquez, Professor of the Faculty of Medicine of Paris. Translated and edited by George F. Laidlaw, M.D. Introduction by William S. Thayer, M.D., Johns Hopkins Hospital. Illustrated. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 743.

Since its publication in French in 1921, Dr. Vaquez's excellent book has been favorably known to American physicians who are particularly interested in cardiology. The wider reading public among the profession owe Dr. Laidlaw a debt of gratitude for making this splendid monograph available to those who do not read French. Vaquez is the leading French clinician in the realm of diseases of the heart and, as Professor Thayer says in his introduction, "the rare book that presents the life work of one wise man holds for itself a permanent place in medical literature." Dr. Vaquez seized the opportunity of this American edition to undertake a thorough revision of the book. The material is presented in five major sections: 1, methods of examination; 2, the cardiopathies and arterial hypertension; 3, the arrhythmias; 4, heart failure; 5, treatment. The chapter on arterial hypertension is of particular interest for Vaquez has himself made some fundamental contributions to the subject. He holds that hypertension precedes the renal and vascular lesions, a view that is finding ever wider acceptance; but he still clings to the idea for which there is no experimental evidence that it is due to an overactivity of the chromaffin system. It is difficult to select chapters for special commendation, for they are nearly all written with the same finish and accuracy. It is only when the author theorizes as to the mode of origin of the various cardiac disorders that we cannot follow him, for like all French clinicians, he allows his fancy too wide a latitude. However, he is careful to differentiate fact from hypothesis. The chapter on chronic myocarditis is a bit disappointing. Vaquez retains this term for the myocardial degenerations. His presentation of the clinical picture is not up to the standard of the other chapters. Dr. Laidlaw's translation is faithful and fluent. Indeed, on page 149, he even translated a mistake from the original French to the effect that Stephen Hales' pioneer blood pressure studies were made on a dog, when in fact that reverend gentleman conducted his experiments on a mare. The brief but adequate historical summaries at the

beginning of every chapter, as well as the selected bibliographies at their end not alone give a scholarly background to the book, but add greatly to its value. The volume can be recommended as by far the best text book on diseases of the heart that has been published in this country in recent years.

HUMANITY

Manhood of Humanity. The Science and Art of Human Engineering. By Alfred Korzybski. New York: E. P. Dutton & Company, 1921. Pp. xv-264.

We may have been accustomed to think of the distinguishing characteristic of humanity in somewhat more psychological terms than does this present author. Yet we cannot fail to be restimulated to the task to which he so earnestly calls his readers through his novel statement of the problems which our generation has brought us. Korzybski urges manhood to awaken from its previous infancy, which has extended through all the ages. He sets the task of entering into humanity's manhood in the formulas of mathematics, making it a matter of practical engineering to set to work upon the direction and control of real progress. Let us clear ourselves, he says, of the old confusing notions that man is only animal or that he is a hybrid of beast and divine. His place in nature is sufficiently grounded in an evolutionary past and yet exalted enough in its ethical possibilities to justify an emphasis upon his particular capacity, which the author defines as the "time binding" one. This lifts man from mere dominance in space, which he shares with lower creatures. It gives him the possibility of retaining his past and recreating it into new achievements. These achievements are not his mere multiplication in numbers nor the increase of material comforts with which he surrounds himself. The rapid growth of these is in geometrical progression in contrast to the slower arithmetical rate of his more profound and lasting achievements, his truer and deeper creations. This has caused the lack of balance which periodically produces cataclysmic upheavals to overturn civilizations. Recognition of the mistaken conceptions which the writer thus combats and the realization of man's past as thus bound to him, must be the preparation for a more definite building of humanity in the future.

WORK OF AMERICAN QUAKERS IN FEEDING GERMAN CHILDREN

Grösse und Gewicht der Schulkinder und andere Grundlagen für die Ernährubgsfürsorge. Neubearbeitung der "Praktischen Winke für den musternden Arzt" für den Gebrauch der bei der amerikanisch-deutschen Kinderspeisung (Quäkerspeisung) beschäftigten Arzte (1. August, 1921). Mit sechs graphischen Darstellungen und einer Übersichtskarte. Herausgegeben vom Deutschen Zentralauschuss für die Auslandshilfe E. V. durch dessen Arztlichen Beirat. Berlin: Verlag für Politik und Wirtschaft, 1924. Pp. 80.

This brochure reports the findings in the Quaker feeding of undernourished children in Germany. Work of this kind has never been carried out on so large a scale. The funds were supplied by American Quakers, but the medical work was carried out by German physicians. This report is an amplification of a previous treatise, *Practical Hints to Examining Physicians,* which was published for the purpose of obtaining average values for the size and the weight of schoolchildren. These findings are now supplemented by similar values found in the preschool age. The results of such investigations in other countries, such as England, United States, Austria, Sweden and Denmark, are also given for the various ages.

The examinations in Germany were conducted in twenty-one large cities and in two districts. Almost a quarter of a million of children and adolescents up to the age of twenty years were examined and the averages found are given in tabular form and in graphs, making them very accessible for reference. The individuals examined were classed as normal, subnormal and hypernormal. The proper development of a child is determined by means of the semi-yearly increase in size and weight of the body. Such data have never been given much attention, especially as applying to the early years of life up to the sixth.

The examinations were made only by physicians. Only such children were selected for the feeding as showed malnutrition from insufficient food and whose malnutrition was due to changes in economic conditions. The selection was determined by the data obtained through mensuration and weighing, inspection of the body stripped down to the waist, examination of the internal organs and the past history, especially the conditions of feeding in the home and past diseases.

This report contains ninety tables, a comprehensive bibliography and an index, all of which should be of great value to physicians, school authorities, social authorities, social agencies, statisticians and municipal authorities.

TUBERCULOSIS OF BONES AND JOINTS

Tuberkulose der Knochen und Gelenke. By Prof. F. Oehlecker, M.D. 356 illustrations. Berlin und Wien: Urban & Schwarzenberg, 1924. Pp. 405.

This is an up to date text book on tuberculosis of bones and joints. In his preface the author tells us that he commenced this work before the world war and that only at this late date has he been able tc complete it. The first portion of the book deals with the pathology and etiology which is all interesting and very explicit, but offers nothing which has not been said before. Next comes the diagnosis and here the author justly states the x ray finding to be the most important modern means to obtain a definite diagnosis of localized tuberculosis in either bone or joint. Concerning tuberculin as a means to obtain a definite diagnosis in bone and joint tuberculosis the author is most skeptical, in fact he considers it of relatively little value. He says a negative von Pirquet must be considered uncertain in suspected bone tuberculosis while a definite röntgen picture would clear up any possible doubt.

The next chapter deals with the relation of traumatism to bone tuberculosis and here the author gives a pathetic picture of the many cases of bone tuberculosis found in war veterans. While he admits trauma as creating a *locus minoris resistentia,* he believes bad hygiene in improvised field hospitals, privation, underfeeding and exposures to all kinds of weather to be the underlying causes of the many cases of local tuberculosis in the young exsoldiers who had entered service in full health and strength.

Oehlecker gives credit to Bier for his method of hyperemia and also to Iselin for his method of applying the x ray in surgical tuberculosis, but without his saying so, one can read between the lines that he is not overenthusiastic about it. In speaking of heliotherapy he gives credit first to Bernhard and then to Rollier for having inaugurated this invaluable therapeutic means in its modern application. He thinks it regrettable, however, that in their works neither Bernhard nor Rollier give credit to the Greeks, the Romans and the Egyptians who were the true originators of heliotherapy. While fully appreciating the wonderful results obtained by Rollier and his disciples, this author wishes it to be understood that in the therapeutic management of tuberculosis of bones and joints he believes good substantial food, light and air and sunshine to be most important features. The utilization of sunlight at high altitudes he considers the best form of heliotherapy, but he believes that good therapeutic results can also be obtained in favorably located seacoasts and lowlands where heliotherapy may be combined with aerotherapy. Artificial light, that is to say, phototherapy, may be classed as an adjuvant at climatically unfavorable times, but its value should not be overestimated. Because the local lesion demands the same constant attention as the general treatment, he favors special sanatoria for this class of tuberculous invalids.

The second portion of this most interesting volume treats exclusively of the surgical and orthopedic management of tuberculosis of the cranium, spinal column, pelvis, hip and kneejoint, long and short bones, sternum, shoulder and elbow joints, and tuberculosis of the hand and foot. Nothing is omitted and admirable illustrations of anatomical and pathological specimens, of tuberculous deformities before and after treatment, and of orthopedic appliances and the manner of preparing them, enhance the value of the contribution. Rather interesting are the author's remarks in this chapter concerning the operation devised by our own Albee, which, as is well known, consists in the transplantation of a part of the tibia to replace the destroyed portion of the vertebræ and straighten the curvature. Oehlecker regrets that some of his German colleagues have abandoned the operation because of failures and although he too cites some of the disadvantages of the operation, he maintains that early favorable cases with not too pronounced a curvature can be greatly benefited by the Albee method, providing that the patient is kept in a recumbent position until the spinous processes are thoroughly united in the operated section.

It may safely be said that this book as a whole is one of the latest and best guides for physicians as well as surgeons in a successful management of those still so very prevalent afflictions which have their origin in the bacillus of tuberculosis.

THE HUNTERS

Memoir of William and John Hunter. By George C. Peachey. Plymouth: William Brendon and Son, Ltd., 1924. Pp. 313.

The history of those brilliant pioneers of medicine, William and John Hunter, is intimately connected with the history of Guy's Hospital. So it is fit that Peachey write this work concerned with the labors of the two Hunters. There are many reasons why physicians, no matter in what field of medical endeavor, should read this book. Primarily, as a debt to themselves and indirectly to the profession they represent. No more thrilling story of human accomplishment can be imagined. We too soon forget our heroes of medicine, heroes in the work of construction, for the welfare of man, while the military heroes, who specialize in destruction, find many morbid followers. Assurance is given that the physician who reads this book will pay his obligations gladly for he will be repaid many times in the reading.

Anatomy, yes medicine as a whole, owes a debt of gratitude to these two men, the Hunters. The least we can do is to better know them. They have inspired many followers; may this work serve to broaden the circle of their admirers.

KALEIDOSCOPE

Arnold Waterlow. A Life. By May Sinclair. New York: The Macmillan Company, 1924.

Turn the tube of this toy fantasy and patterns tumble into gleaming form. Another turn and they shift and reform, stars and triangles, crystal designs, color and no color. Lives tumble themselves into such ever shifting pictures. And within the sharp fragments of each life lie color and grey routine.

A play of triangles is Miss Sinclair's latest book. Arnold Waterlow is impelled into triangular situations from the moment of birth. Arnold, his mother, and Richard, his older brother; Arnold, his mother, and the dead child; good boy, bad boy, and father; Arnold, his mother and his father. Always Arnold's corner of the triangle is the one that gives. He learns in infancy that the exquisite torment of his love for his mother finds assuagement only through suffering. A tragic lesson for a child, but one only too frequently learned.

The rest of his life Arnold continues this piecing together of different triangles. Mother—son—wife; mother—son—mistress; to say nothing of son—wife—and lover, and son—wife—and mistress! The patterns shift into each other with their perpetual gleam of suffering, the sharp gash of a ragged triangle. At this technical job, Miss Sinclair has surpassed herself. Naturally the only straw Arnold Waterlow has to cling to is his philosophy. It becomes a trifle monotonous. And finally even the philosophy suffers what appears to the skeptical reader as a setback. Arnold has shaken himself free of his mother at last, he is in sight of the way out of the treadmill that his life has become. Then comes the crash—and after he has weathered it, there is nothing left but to seek the mother tenderness of his wife. She at least gives him what in his childhood his own mother denied. And he is safe on familiar ground.

When Miss Sinclair makes her characters try to mould things closer to their hearts' desires, one has an uneasy feeling as though Miss Sinclair were grimly saying: "It can't be done—really." Sad, but true. And the romance of every life is in this shattering of oneself against supposedly beneficient Fate. While the irony ready to the hand of writers like Miss Sinclair is that intrepid people still keep on disbelieving and trying. In spite of everything she has said and will say!

Medicoliterary Notes.

Recent publications of interest are *Race Hygiene and Heredity,* by Hermann W. Siemens, translated by Dr. Lewellys F. Barker (Appleton), and *Rimbaud, the Boy and the Poet,* by Edgell Rickword (Knopf).

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Tantrums in Childhood and Related Emotional Reactions is the subject of an interesting study and report by Dr. Edith Spaulding, published in the October *Medical Woman's Journal.* The article is reprinted from *Archives of Pediatrics.*

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The Jest, a drama from the Italian which a few years ago had a successful run in New York with John Barrymore as the leading character, has recently been put into opera form and produced in Milan, where it received an enthusiastic reception. The composer is Umberto Giordano.

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A new journal of abstracts printed in English has recently made its appearance in Vienna. It is published by Dr. Max Ostermann and has the title *Ars Medica.* It contains not only abstracts, summaries and reviews of important medical articles published abroad, but also brief original contributions from foreign authorities on medical subjects.

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The Golden Book Magazine of Fiction and True Stories is the title of a new periodical which made its appearance with the January number. It is edited by Henry Wysham Lanier, with the cooperation of an editorial board composed of William Lyon Phelps, Stuart P. Sherman, John Cotton Dana and Charles Mills Gayley. It is to devote itself chiefly to the reprinting of short stories by the best writers of all countries. Among authors represented in the first issue are Verner von Heidenstam, O. Henry, Richard Harding Davis, Tolstoi, Robert Louis Stevenson, Georges du Maurier, Kipling, Mark Twain, De Maupassant, and Heinrich Heine.

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The Division of Industrial Hygiene of New York State is making an intensive drive throughout the State for the purpose of making a thorough study of lead poisoning. Cause, prevention and elimination of the hazard will be investigated and physical examinations made of those exposed. The chief purpose of the study is to determine which industries and occupations present a definite hazard as to this type of poisoning.

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The publishers have announced that M. R. Werner, author of *Barnum* and whose new biography of Brigham Young is soon to be out, is now working on another book the subject of which is to be Aaron Burr.

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The year 1923 was remarkable for the lowest death rate and lowest infant mortality rate ever recorded in London. The civil population is estimated at 4,564,109 and the non-civil at 6,000. The birth rate was 20.1, the death rate 11.4, and the infant mortality rate 61. The death rate from tuberculosis and cancer were 1.2 and 1.4 per 1,000 population respectively. In the course of 80 years the Londoner's expectation of life has been extended from 34.6 years to 53.8 years for males, and from 38.3 years to 59.1 years for females.—*Lancet.*

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Yale University Press has recently put out a third edition of Ellsworth Huntington's *Civilization and Climate,* a study of the distribution of human energy on the basis of climate.

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First Aid to Animals is the title of a late publication by Harper Brothers. Dr. John L. Leonard, the author, treats his subject from a point of view both humanitarian and practical, and in a style so simple and untechnical that the book will be of service to the layman as well as to the veterinarian.

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A life of Dr. William Crawford Gorgas has recently been issued by Doubleday, Page. The joint authors are Marie D. Gorgas and Burton J. Hendrick.

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Thebes was the original Reno, according to the *Zeitschrift für Kulturgeschichtliche und Biologische Familienkunde,* which discusses a document recently discovered in an Egyptian tomb, alleged to be two thousand years old and the first divorce decree in reported history which is thoroughly authenticated. This decree is in the Demotian dialect, bearing the signature of a notary named Thut. It does not indicate the ground on which the divorce was granted.—*N. Y. World.*

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The Connecticut Agricultural Experiment Station reports that of commercial "vitamines" recently tested, forty per cent. were found useless, twenty-five per cent. inferior, and fifteen per cent. superior in the vitamine potency when fed to white rats in comparison with dried brewer's yeast of good quality. Fillers and various drugs were found in some of these socalled vitamines.

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The Massachusetts Department of Mental Diseases has recently had added to it a new Division for the Examination of Prisoners to carry out the law passed by the State Legislature requiring the psychiatric examination and study of all prisoners sentenced to the county jails for more than thirty days.

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More than one fourth of all negro children born alive die before five years of age, according to Dr. J. H. Mason Knox, writing in the *Journal of the American Medical Association.* Among the outstanding causes of infant mortality in negro infants are: prematurity, tuberculosis, syphilis and secondary pneumonia. In the registration area deaths from syphilis and tuberculosis are each four times as frequent in the negro as in the white, and from pneumonia 2.3 times as many. The three diseases—syphilis, tuberculosis, and pneumonia—account for twenty-nine per cent. of all infant deaths among negro children, and only seven per cent. among white children.

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Announcement has recently been made that the American Council of Learned Societies will produce a dictionary of American biography on the plan of the well known *British Dictionary of National Biography.* Dr. J. Franklin Jameson, chairman of the committee of management, is director of the Department of Historical Research in the Carnegie Institution, Washington, and was chairman of the committee from the American Council of Learned Societies that drew up the original plan for the work. At least ten years will be spent in compiling the dictionary, which will include sketches of the lives of about twenty thousand illustrious Americans.

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The following quotation from a number of the *Virginia Health Bulletin* needs no explanation as a commentary on the evils of red tape:

The nurse visited a school. The teacher pointed out a child who had enlarged tonsils. The nurse, having given the inspection, and feeling that it was an urgent case, started directly to the child's home, a distance of two miles. The parents were found to be cooperative, but the nurse learned that there was no family physician, only one the mother had had for herself about a year before in an emergency. The nurse drove ten miles to see the physician to ask him to make the diagnosis. She then drove back the ten miles, got the child, and took him to the doctor, another ten miles of driving. By the time the dagnosis had been made, the child returned home, and the nurse back to headquarters, fifty miles had been driven. An operation having been advised, the surgeon had to be seen and bargained with. He was twenty miles away; it was another twenty miles to get back to the home and instruct the mother as to the preparations of the child before the operation. Then forty miles were covered in taking the child to the hospital and the nurse back to headquarters. Eighty miles were driven that day and forty the next day in bringing the patient back home.

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An interesting document recently published in France is the account of the trial and execution of the notorious "modern Bluebeard," Landru, as seen by the three chief reporters who covered the case—Henri Béraud, Emmanuel Bourcier, and André Salmon, all of whom have written novels. There are included interesting pen portraits, not only of the gay little engineer with his bald head and great beard who is said to have had 293 mistresses, but also of the prosecuting attorney, M. Godefrey, and the defense attorney, M. de Moro-Giafferi, a kind of Parisian Clarence Darrow.

Abstracts from Current Literature

GASTROENTEROLOGY

Pathology and Symptoms of Duodenal Ulcer.—H. Tyrrell Gray (*British Medical Journal,* June 14, 1924) states that the predisposition to duodenal ulcer is the relative increase of the normal vagus stimulation, which establishes the socalled duodenal stomach. Tobacco is the outstanding cause. Factors which may excite ulceration in such a type of stomach are: 1, acid; 2, distention; 3, trauma; 4, infection, and possibly 5, alcohol; the effect of all these in producing ulceration is accentuated by an incompetent pylorus. Any combination of these exciting factors may determine ulcer formation in such a type of stomach; but in the sympathetic type with the closed pylorus (the antithesis) a gastric ulcer is the more probable result.

Penetrating Ulcers of the Stomach.—John L. Kantor (*Medical Clinics of North America,* July, 1924) states that penetrating ulcers of the stomach may clinically and röntgenographically resemble cancers. A differentiation between the two may be made by observing the effect of bedrest on the size of the niche. The seven patients treated conservatively by the author showed disappearance of the niche and became well, although it is not implied that they will remain well. Medical treatment is the method of choice. A properly managed cure implies absolute rest in bed for from one month to six weeks. No form of treatment yet devised seems to affect the tendency to recurrence which is presumably due to some unknown constitutional factor of diathesis.

Röntgen Ray Studies of Stomach Function.—Julian L. Rogatz (*American Journal of Diseases of Children,* July, 1924) found that the infant stomach exhibits a socalled peristaltic function, the actual existence of which may be demonstrated by röntgenographic exposures. The infant stomach reacts differently to fluids and to semisolids, as follows: a, with fluids the stomach assumes either a pear or oval shape, horizontal in position and extending to or beyond the midline, the air bubble being large or moderate in size; b, with foods of very thick consistency the baby's gastric organ contracts down to a small, circular or oval shape, barely reaching the midline, never extending beyond, and with a very small air bubble, or often none at all. The peristaltic reflex has an important, practical significance in the treatment of pylorospasm and habitual vomiting.

Value of Feeding During Operations on the Stomach.—Herbert H. Brown (*British Medical Journal,* April 26, 1924) avoids postoperative shock and leaves the patient in a better condition after operation than before it by using the following procedure: Before the inner row of catgut sutures surrounding the gastrojejunostomy opening is quite completed the suturing is stopped, leaving an opening of about a quarter of an inch or less. The jejunal clamp is removed, and stomach and jejunum compressed between the finger and thumb of the left hand to prevent escape of fluid; a No. 10 soft rubber catheter, connected by a short length of tubing to a funnel, is introduced through the opening and passed along the jejunum (the finger and thumb keeping up compression around it), until about eight inches or more have passed along the gut into a coil which is within the abdominal cavity. The food, consisting of a pint of peptonized milk with a beaten egg and one ounce of brandy, is then poured slowly into the funnel through a gauze strainer. The catheter is then withdrawn and the operation is completed.

Acute Appendicitis in Children.—W. A. Thompson (*British Journal of Children's Diseases,* July-September, 1924) states that the diagnosis is comparatively difficult because of the difficulty of obtaining an accurate history and a proper physical examination. The symptoms of appendicitis progress much along the lines followed in the adult, but the early pain may easily be overlooked. It is usually umbilical or diffused throughout the abdomen at first, and later may be located in the right iliac fossa, right lumbar region, suprapubic region, or it may remain umbilical. Vomiting is the next feature. It is usually present in every case and in the majority occurs immediately after the pain. Localized tenderness next appears and is the most important evidence of all. It gives an indication of the position of the appendix. The temperature is not of much clinical value in the child. The differential diagnosis includes pyelitis, acidosis, inflamed glands in the ileocecal region, basal pneumonia and diaphragmatic pleurisy and Henoch's purpura. A drainage tube is inserted in all cases of perforation and in cases where there is much oozing from previous adhesions. The tube is removed as soon as possible after thirty-six hours. Eserine or pituitrin, in some cases both, are used from the third day to promote evacuation and relieve or prevent flatulence.

Chronic Primary Intussusception in Children.—H. E. Marsh (*Annals of Surgery,* February, 1924) offers the following conclusions: Chronic primary intussusception in young children is relatively uncommon. The clinical and operative histories of two children operated on at the Mayo Clinic are recorded. The symptoms may be vague and misleading, but careful investigation into the past history, and observation of the child during an attack, will often suggest the true condition. Intermittent attacks of abdominal pain of sudden onset, occurring over a period of weeks or months, of short duration, and disappearing suddenly with complete relief, are characteristic.

Symptoms of Achylia Gastrica.—Bryce W. Fontaine (*Southern Medical Journal,* July, 1924) says that the diagnosis of achylia gastrica cannot be made from the history, from a study of the symptoms, or from a radiographic study, but is absolutely dependent upon an analysis of the gastric contents after a suitable test meal, and it will frequently be overlooked unless this analysis is made a routine part of every general examination.

The Creatinin Test for Renal Function.—Ralph H. Major (*Southern Medical Journal,* July, 1924) says that the principle underlying the creatinin test is the calculation of the creatinin excretion for definite periods of time before and after the injection of creatinin into the circulation. In most of the tests the following procedure has been carried out: The patient empties the bladder and the urine is collected for the period of one hour. He then is given 0.5 grams of creatinin intravenously, the urine is collected for one hour and then again at the end of two hours. The excretion of creatinin for the first hour and for the second hour after injection is compared with the excretion before injection.

Partial Duodenal Obstruction.—George E. Nesbit (*Irish Journal of Medical Science,* April, 1924) says that partial duodenal obstruction can be demonstrated in a large proportion of cases with chronic dyspeptic symptoms. The cause of the obstruction varies, but the most common is compression by the superior mesenteric artery. It is nearly always associated with an abnormal condition of the colon. The possession of a mesentery, i.e., mobility, alone is not sufficient; some other factor is necessary, such as descent over the pelvic brim, chronic constipation, or loss of tone in the abdominal muscles. Treatment consists in regular emptying of the colon with support for the latter by an efficient abdominal belt. Failing improvement on these lines, colopexy is indicated, or possibly duodenojejunostomy.

Unsuspected Hypertoxic Appendicitis.—E. St. Jacques (*Canadian Practitioner,* July, 1924) emphasizes the following points.

1. Acute appendicitis is sometimes hypertoxic and rapidly gangrenous. 2. The toxicity induces acute infectious enteritis immediately. 3. Diarrhea seems the dominant characteristic of these cases. 4. Pain is present; at the onset localized at McBurney's region—as a very careful inquiry brings out—but is rapidly generalized to the whole of the abdomen on account of the acute enteritis. 5. The degree of pain is moderate at McBurney's point at the onset, usually escaping the attention of the patient on account of its spreading rapidly to the whole abdomen. This is due to the enteritis. 6. Of muscular defence or rigidity there is none or little at the onset, but is well marked when diffuse peritonitis sets in. 7. The pulse is usually very rapid from the start due to the very infectious character of the disease. 8. The temperature may be only moderate and is sometimes subnormal. 9. The general condition of the patient is decidedly bad from the onset. 10. Let us not forget that this

particular variety of acute hypertoxic appendicitis is not rarely met with in children, as Comby and Dieulafoy have well pointed out, in their clinical lectures, and also in adults, and that its course is rapidly fatal, if not operated upon early. 11. The etiological factor is the colon bacillus not infrequently, streptococcus frequently and, in the rapidly hypertoxic variety, anaerobic bacilli, the Welch's bacillus, or other. 12. Lastly, never lose sight of the clinical fact that in children, so prone to pneumococcic peritonitis—which is usually primitive without a former acute pneumococcic infection—this type of appendicular peritonitis is in the vast majority of cases accompanied at the very onset by diarrhea.

Drainage of the Peritoneal Cavity and the Physiological Protective Capacity of the Peritoneum.—As a result of his experiments on animals, L. Schönbauer (*Wiener klinische Wochenschrift,* April 24, 1924) comes to the conclusion that drainage has no unfavorable influence upon the resorptive powers of the peritoneum, but it cannot draw off the secretions. Drainage is indicated in cases in which the source of the infection cannot be closed off and where a clean condition of the wound cannot be achieved. It should be used for the purpose of walling off sections of the peritoneum that have not as yet been infected. The peritoneal cavity may be closed after operations only when the peritoneal exudate is sterile.

Partial Gastrectomy for Gastrojejunal Ulcer.—D. C. Balfour (*Annals of Surgery,* March, 1924) gives a detailed and illustrated account of the operation herein outlined, stating that it has been highly successful at the Mayo Clinic.

The operation consists in cutting off the gastroenterostomy, excision of the lesion, closing the opening in the jejunum, resecting the pyloric end of the stomach, including the opening of the anastomosis, with restoration of continuity by whatever method is best suited to the case. This operation, partial gastrectomy, has such distinct advantages, particularly in its end results, that I bring it to your attention.

Hemorrhage in Abdominal Injuries.—J. M. Mason (*Annals of Surgery,* March, 1924) gives several statistical tables of hemorrhage series, from the point of view of mortality per cent., and concludes as follows: To secure a reduction in the mortality rate of the small hemorrhage series, which stands at thirty-six and one tenth per cent. where there is visceral injury, we must depend upon early operation; refinement of surgical technic; lessening the shock of prolonged ether anesthesia by a more extensive use of local anesthesia, nitrous oxide or ethylene anesthesia, and the most careful attention to the details of after treatment. To secure a reduction in the mortality of the large hemorrhage series, which stands at eighty-seven and two tenths per cent. in the operative cases, all the requirements above noted must be observed, and donors for transfusion must be obtained regardless of trouble or expense.

Chronic Appendicitis.—J. Selinger (*American Journal of Surgery,* March, 1924) reviews the symptoms of this disease, and its peculiar aptitude for being confounded with other abdominal affections. He points out the differences of chronic appendicitis from some of these, and stresses the value of a clear, complete, and concise history in making the differential diagnosis. He concludes: "Chronic appendicitis is not a mental condition. It is truly a pathological process, a symptom producing disease. It requires study, a differential diagnosis and treatment. This treatment is surgical. It is not an emergency operation, but the organ should be removed at convenient time, soon after the diagnosis is made. The close lymphatic association between the appendix, the gallbladder and the stomach should be a warning of the probability of disease of the two latter organs, if a diseased appendix is allowed to remain."

Treatment of Severe Gastric and Duodenal Hemorrhage.—Arthur F. Hurst (*Lancet,* May 31, 1924) recommends the following treatment in cases of severe gastric and duodenal hemorrhage: A stomach tube is passed just far enough for the end to reach beyond the cardia to prevent direct disturbance of the bleeding surface. The stomach is then emptied with an evacuator. The stomach is next washed out with about four ounces of ice cold water, and this is repeated until the washings are no longer blood stained. An iced one in one thousand ferric chloride solution may be used instead of water. When the last traces of water have been evacuated, a dram of one in one thousand adrenalin chloride solution is poured into the stomach before withdrawing the tube. The gastric juice should be rendered inactive by neutralizing it with alkalies, like oxide of magnesia, calcium carbonate, calcium chloride, or bismuth carbonate. All septic foci should be sought and carefully eradicated. Preparations should also be made for transfusion if necessary. The only indication for operation in the acute stage is the occurrence of severe and persistent hemorrhage in an elderly individual with a long history of chronic ulcer and degenerated arteries.

Gastrojejunocolic Fistula.—W. A. Brams and K. A. Meyer (*Surgery, Gynecology and Obstetrics,* May, 1924) offer the following résumé to their series of cases:

1. Gastrocolic and gastrojejunocolic fistula have increased in frequency because of the more common surgical treatment of gastric and duodenal ulcers. 2. The prefistulous stage is the gastrojejunal ulcer after operation. 3. Any or all of the manifestations of fistula may be absent, but persistent dyspepsia and diarrhea after operation should lead us to suspect a gastrocolic or gastrojejunocolic fistula. X rays in several positions repeated several times, as well as the various methods of introducing colored substances per rectum and recovering them on washing out the stomach may establish the diagnosis in doubtful cases. 4. The four cardinal symptoms of a welldeveloped case of fistula are fecal vomiting, fatty stools, diarrhea, and the x ray findings. 5. Radical surgical treatment is the only method of curing the condition, and the earlier it is undertaken the easier will be the operation and the shorter the postoperative course.

Treatment of Hypertrophic Pyloric Stenosis.—F. John Poynton, T. Twistington Higgins, and J. M. Brydson (*Lancet,* February 2, 1924) advise operation at the earliest possible moment after the diagnosis has been definitely established. In the present state of our knowledge of the pathology of pyloric stenosis, operation offers the most speedy and certain cure of the disease. The Rammstedt procedure is the operation of choice. The best results are obtained with the earliest possible operation. The only absolute diagnostic sign is the presence of the pyloric tumor; without this sign operation is justified only in rare instances. In breast fed infants, where symptoms and signs develop suggestive of pyloric stenosis, the infant should not be weaned until a definite or negative diagnosis can be made, because experience has shown that feeding with breast milk is of great assistance to recovery.

Transverse Incision in Appendicitis.—A. E. Rockey (*Annals of Surgery,* May, 1924) describes the operation in detail, gives positions, and discusses his system of dependent drainage. In the operation the fibres of the transversalis and internal oblique muscles are directly transverse to the line of incision. The internal oblique, though varying a few degrees, is further cut, and so soft that the variation is of no consequence in operation. The actual cutting is confined to the fascia of the rectus and the aponeuroses of the muscles. The incision is then spread wide by a vertical, or up and down pull. The wound is drained through the lowest part of the cavity, i.e. the outer end of a transverse incision.

The author states that hernia is very rare after operation by this method, and he vehemently recommends it and the dependent drainage in the worst of suppurative cases, saying that its superiority in these will soon demonstrate its special fitness for the majority of others, until its general use will become a routine.

Physical Treatments in Gastrointestinal Disorders.—Anthony Rassler (*American Journal of Eelectrotherapeutics and Radiology,* May, 1924) emphasizes the fact that the d'Arsonval current has been of help in hypertension cases, not a few patients having felt better after the treatment, and, although the drop in the mercury column has been definite, many have reported that it does not last. He believes that the best results associated with the d'Arsonval treatment are obtained by placing the patient on a low diet, the employment of radium, hot packs, rest in bed, freedom from emotional disturbances, with small doses of the iodides and the maintenance of brisk elimination. He emphasizes the value of diathermy in the treatment of painful gallbladder conditions, with the relief of subjective and objective pain in this way. He refers to the employment of the x ray in the treatment of hyperthyroidism, stating that it has become recognized as a valuable method of treatment. He prefers the x ray to radium in the treatment of fibroma. He speaks of the value of the x ray in hyperchlohydria.

Vitamines and the Borderland Between Health and Disease.—W. Cramer (*Lancet*, March 29, 1924) believes that there is a misconception of the mode of action of the vitamines, which has led to an underestimation of their value in nutrition. The borderland between health and disease, due to a deficiency of the vitamines, has not been sufficiently explored. Animal experiments show that highly differentiated organisms require a maximum supply of vitamines, especially in the early part of their life, to reach their full development. Any deficiency in this supply leads to imperfect development, which need not necessarily produce disease or poor health and need not affect reproduction. The result of such a deficiency is evinced in an undersized, poorly nourished population with a diminished resistance to disease. Vitamines have a positive physiological action, similar to that of the hormones. Specific pathological lesions can be demonstrated when vitamines are deficient in the food. The greatest need for these hormones is felt immediately after birth and in the early years of life at the time when the organism is adapting itself to its new surroundings and when the tissues assume their respective functions. This conception may be extended even to other than deficiency diseases.

Etiology of Anaphylactic Phenomena.—As a result of his observations, Karl Hajós (*Wiener klinische Wochenschrift*, June 12, 1924) comes to the conclusion that the most important factor in alimentary hypersensitiveness is a constitutionally deficient gastrointestinal mucosa or a tendency toward dyspepsia, enteritis, etc., inasmuch as the penetration of unchanged proteins would be difficult to explain in any other way. The rectal source of urticaria in one of his patients and the attack of asthma in another show that a circumvention of the liver results in a greater predisposition to the anaphylactic attack in some instances. Therapeutically, animal charcoal gives some very good results in cases of alimentary anaphylaxis, especially in urticaria. The effect of Witte peptone, given by mouth, appears to be problematical in many cases, as the oral administration of the peptone only acts as a desensitizer when it reaches the blood stream in an unchanged condition. In the nonspecific process of desensitization only the parenteral route deserves consideration. The active immunization is possible with fluid protein extracts and the omission of the offending article of food from the diet is often very difficult and bothersome to the patient without the promise of achieving success.

Treatment of Hour Glass Stomach.—C. L. Gibson (*Annals of Surgery*, November, 1923) says that in general it may be stated that resection in the hour glass stomach is to be avoided if the condition can be adequately dealt with otherwise, for the following reasons:

1. The hour glass stomach is the end result of a long standing, particularly severe gastric ulceration and most of the patients are greatly debilitated and poor risks.
2. Any form of resection has a definite risk of being followed by any of the varieties of pneumonia.
3. Gastroenterostomy may very often be performed with great ease under local anesthesia, particularly if the abdominal wall is thin and lax and the stomach is large, or ptosed, as it generally is in emaciated patients.
4. Other operations of less severity give good results.

In conclusion I would call attention to the hint furnished by the size of the lower pouch, as regards the presence of a second obstruction at the pylorus, and it is in these cases where the stomach is divided into pouches of different sizes, or the lower pouch is distinctly large, that the operation of double posterior gastroenterostomy is particularly indicated.

Lymphaticostomy in Intestinal Obstruction.—W. A. Costain (*Surgery, Gynecology and Obstetrics*, February, 1924) describes the experiments which led him to the following conclusions:

1. Toxemia in acute intestinal obstruction is due to the absorption of toxins formed from necrotic tissue.
2. When in total occlusion the upper obstruction is just below the pancreatic ducts there is rapid necrosis of tissue above the obstruction and death, but when the obstruction occurs above the ducts just beyond the pylorus even though more area is obstructed the accessory gland digestive juices, and especially that from the pancreas, are neutralized lower down and necrosis and death are considerably delayed.
3. The absorption of toxins is through the lymphatics to the thoracic duct.

The practical application of these findings to surgery has not been worked out. Merely touching on their bearing on surgery one may say that they call for the withholding of fluids by mouth, dehydration being combated by intravenous infusions. They indicate that in all operative procedures the lymphatics should be taken into account, and to prevent a continuation of the absorption of toxins in some obstructions it may be necessary to supplement the relief of the obstruction by a lymphaticostomy. Should this be done the continual administration of water through a duodenal tube will help to keep a constant drainage from the duct and prevent blocking.

Multiple Polyposis of Gastrointestinal Tract.—A. E. Struthers (*Surgery, Gynecology and Obstetrics*, May, 1924) presents the following conclusions:

1. Multiple polyposis of the intestinal tract is a serious disease from the standpoint of morbidity and mortality. 2. The cause of intestinal polyposis is not known, although chronic ulcerative colitis appears to be a prominent factor. 3. There is no specific medical treatment, and operation undoubtedly offers the best results in all cases. 4. The predominant symptoms are diarrhea, with the passage of pus and blood, vague abdominal pain, and rectal tenesmus. 5. Multiple polyposis is a disease of the large intestines and of the stomach. The small intestines are rarely involved. 6. Proctoscopic examination should be made routinely in all cases of dysentery of more than a few days' duration. 7. The röntgen ray is practically the only means of diagnosing multiple polyposis of the stomach, or above reach of the proctoscope in the bowel. 8. The disease terminates in malignancy in a large percentage of cases. 9. Most marked involvement of the colon is found in the cases which begin as a mild diarrhea and later become chronic. 10. The findings in one patient would tend to confirm the correctness of Menetrier's terminology "gastritis polyposis."

Isolation of Submucosa in Intestinal Anastomosis.—A. J. Graham (*Surgery, Gynecology and Obstetrics*, February, 1924) offers the following conclusions from his study:

1. In Lembert's time the principle was established that "raw tissues of like nature will unite if held approximated long enough" and union was secured by approximating the peritoneal coats.
2. Halsted showed that all intestinal suturing must be with the submucosa as the basis (the skeleton).
3. Students should see this structure isolated; they take better stitches afterward.
4. The submucosa must be taken into consideration in regard to drainage of bacteria and toxins from obstructed loops of bowel; and in regard to making and closing fistulae. It may be utilized to prevent extension of peritonitis by walling off areas.
5. All through and through and most Lembert stitches slough to the lumen of the bowel; a few encyst at the serosa, being cut off by the action of the muscular coats.
6. The tendency to throw off a foreign body by sloughing out is stronger than the tendency to absorb it.
7. Visceral union is a matter of sloughing of suture material, and of absorbing superfluous tissue, and is accomplished in a few days.
8. From the study of this tissue there has been evolved the aseptic resection of bowel by Halsted and others.

Studies in Pancreatic Function.—C. W. McClure (*American Journal of Medical Sciences*, May, 1924) presents the following conclusions:

1. Normal enzymic concentrations of duodenal contents have been established for the methods and procedures described for estimating enzymic concentrations in duodenal contents obtained by the use of the procedures described.
2. Abnormalities in enzymic concentrations having been found only in the presence of some lesion involving the pancreas, either primarily or secondarily, it is concluded that the estimation of enzymic concentrations of duodenal contents furnishes an index to the activity of the external secretory function of the pancreas.
3. The findings in normal persons indicate that the essential factors in stimulating the secretion of pancreatic juice are the products of digestion rather than the acidity of the gastric chyme.
4. The time coincidence of the onset of the flow of bile and pancreatic juice suggests a common stimulant.

5. The external secretory function of the pancreas, as measured by the enzymic concentration of duodenal contents, was found to be much depressed below the normal in chronic pancreatitis.

6. Acute pancreatic necrosis, cancer of the head of the pancreas, and lesions obstructing the pancreatic duct were accompanied by marked abnormalities in the enzymic concentrations of duodenal contents. Obstructive lesions caused great diminution, while acute necrosis often caused dissociation of the concentration of the enzymes.

7. In obstructive jaundice estimation of enzymic concentration of duodenal contents is of aid in localizing the site of the lesion, and in the differential diagnosis between its benign malignant character.

Alimentary Asthma.—Ludwig Hofbauer (*Wiener klinische Wochenschrift,* March 29, 1923) states that the attempt to trace bronchial asthma to anaphylactic phenomena, which are produced by the ingestion of certain foodstuffs, and the consequent desensitization by proteins produced by these substances as a result of cutaneous inoculations, are not applicable in every case. He recommends for these refractory cases the use of humming exercises, in which the patient practises abdominal breathing, which act as massage of the intestines, thereby preventing intestinal putrefaction, which may be a cause of the attacks.

Senile Atrophy of the Liver. — Isolde T. Zeckwer (*Journal of Laboratory and Clinical Medicine,* April, 1924) tabulated the liver weights in consecutive autopsies according to age, excluding, however, gross lesions of the liver, aside from senile atrophy, which would materially alter the weight, such as cirrhosis, tumors, amyloid change, and abscess, and omitting cases under twenty years of age. The study included 309 males and 375 females. A chart is given showing the average weights of livers grouped in five year periods. The greatest average weight was attained between thirty-five and forty years, and was 1704 gm., after which there was a steady decline in weight to an average of 1054 gm. in individuals over 85 years old. A second chart shows the average weights of livers in the two sexes at different ages. The average weight in males is uniformly greater than in females, but the two curves run parallel, both reaching the maximum of 1773 gm. in males and 1612 gm. in females in the third decade, and progressively declining to 1174 gm. in males and 1020 gm. in females after eighty years of age.

Duodenal Hernia a Misnomer.—E. Andrews (*Surgery, Gynecology and Obstetrics,* December, 1923) reports a case which he compares to several in literature, and explains on his own theory and conclusion that duodenal hernia is a congenital anomaly due to imprisonment of the small intestine beneath the mesentery of the developing colon.

ANESTHESIA

Acetylene Anesthesia.—Amiot and Hermet (*Bulletin médical,* August 27 and 30, 1924) note that chemically pure acetylene is a gas with a penetrating odor, but free of the garliclike odor of acetylene made from calcium carbide. As it is extremely inflammable and dangerously explosive when mixed with air or oxygen in sufficient proportions, no flame should be allowed in the vicinity of the patient. The anesthetic properties of acetylene vary in different animals according to the activity of their oxidative processes. Birds, which consume much oxygen, are very sensitive to it, mammals less so, fish hardly at all, and worms and anaërobic organisms not all. Acetylene is a more active anesthetic than nitrous oxide and even ethylene. It is definitely anesthetic when mixed with ten to thirty per cent. of oxygen, which is not true of nitrous oxide. The medullary functions seem to be spared much longer than they are by ether, chloroform or ethyl chloride. Any nitrous oxide apparatus will serve likewise for the prosecution of acetylene anesthesia, but care must be taken not to mix acetylene and oxygen under pressure. The gas is given about like nitrous oxide, but with a larger ratio of oxygen. Cyanosis, rapid breathing and muscular rigidity call for an immediate increase of the oxygen allowance. Analgesia supervenes very quickly, sometimes in thirty seconds. This is an excellent property of acetylene for brief anesthesias, as the drug entails far less risk than ethyl chloride. Muscular resolution and sufficient quiet in the abdominal cavity are obtained in six to eight minutes. The margin of safety is greater than with nitrous oxide. The condition of the reflexes is of no great significance; a lively palpebral reflex may be present in perfect surgical anesthesia. Care should be taken, however, not to allow an exaggerated degree of pupillary dilation. If the anesthesia is prolonged, the oxygen admixture can be raised to as high as 50 per cent. A preliminary injection of scopolamine or atropine will obviate the otherwise very copious salivation. Marked trismus sometimes occurs even during satisfactory resolution. From the standpoint of the surgeon, acetylene is generally more satisfactory than nitrous oxide. Many abdominal operations can be carried out as easily as with ether, and in none of the authors' cases was it necessary to use another anesthetic. There is frequently, if not always, a hypertensor effect, but this did not seem to increase hemorrhage, as it often does in the case of nitrous oxide. Recovery from the anesthesia is rapid, never exceeding three or four minutes. Vomiting was rather frequent, but seldom persistent.

Anesthetic Records.—J. S. Lundy (*American Journal of Surgery,* January, 1924) reproduces numerous records and offers various observations upon them, summing them up as follows.

1. Record keeping will be the future forte of those anesthetists and surgeons who will be satisfied with nothing but the safest surgical procedures.
2. Stimulants in spinal anesthesia shorten the danger period.
3. Nitrous oxide oxygen may be administered to the very old and the very young when great care in the administration of the anesthetic is exercised.
4. That anesthetic records are not difficult to keep and that future advances in practical anesthesia will keep pace with the popularity of such record keeping.

Local Anesthesia in Neck Operations.—W. R. Meeker and H. W. Hundling (*Surgery, Gynecology, and Obstetrics,* June, 1924), say that the neck is one of the most favorable regions of the body for performing operations under local anesthesia. The anatomy of this region is such that either infiltration or regional methods (nerve block and field block) may be employed. If anesthesia sufficient for the conclusion of the operation is to be induced as a preoperative procedure, regional methods are more frequently employed because of the deeper anesthesia. Block of the cervical plexus by the posterior route is employed in cervical laminectomy as part of the procedure in craniotomy for cerebellar explorations, and occasionally when there are contraindications to the employment of the lateral routes. Of the two lateral routes the oblique is preferable because of the greater anatomical safety. Block of the cervical plexus by the lateral oblique method is valuable, either alone or combined with infiltration, in operations on the lateral and anterior regions of the neck. Operations which may be satisfactorily performed under local anesthesia include thyroidectomy, laryngectomy, thyrotomy, and removal of tumors, excision of esophageal diverticula, removal of lymphatic glands, excision of branchial cysts, tracheotomy, ligation of thyroid or carotid vessels and cervical laminectomy. For the excision of furuncles and carbuncles, extensive degenerating glands of the neck and widely disseminated carcinomatous glands, general anesthesia methods should be employed.

Urological Surgery Under Sacral Anesthesia.—O. S. Lowsley (*Surgery, Gynecology and Obstetries,* November, 1923) reports on a series of six cases. He says that the series is much too small to draw general conclusions. His observations and the experiences of others lead him, however, to believe that sacral combined with parasacral is the anesthesia of choice in performing major urological operations *per perineum,* particularly prostatectomy. In perineal prostatectomy under this type of anesthesia there is less bleeding and less shock than there is with any inhalation anesthesia.

Reflex Rigidity Under General Anesthesia.—A. E. Guedel and K. R. Ruddell (*American Journal of Surgery,* April, 1924), say that, contrary to general opinion, the peritoneum is an organ of such low sensibility that it does not in any way produce an interfering reflex response during the course of an operation. The greatest operative reflex interference comes from stretching the muscles alone. In local infiltration of the abdomen as a rigidity corrective measure, only the muscle need be infiltrated.

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Medicolegal Notes.

KENTUCKY STATUTE AUTHORIZES ISSUE OF PRESCRIPTIONS OF LIQUORS FOR MEDICINAL PURPOSES

The Kentucky Court of Appeals holds, Commonwealth v. Galloway, 261 S. W. 887, that Acts Ky. 1922, c. 33, §32, providing that "Physicians may issue and pharmacists may fill prescriptions for intoxicating liquors, under the restrictions of the national federal law," contemplates the issue of prescriptions for liquors by physicians for medicinal purposes, and as the mere permissive right to issue them under the restrictions of the federal act cannot be construed as an inhibition against their issue in any other way, no such duty is imposed by the State act.

The act is a penal one, and the court refused to read into it by reference an intention to create an offense and fix a penalty therefor when the language used is only the granting of permission to do a thing in a particular way without prohibiting the dong of that thing in any other way.

"IMMEDIATE SURGICAL RELIEF" DEFINED.

A rider in an employers' liability policy provided that the policy should not cover "such immediate surgical relief as is imperative," which the policy itself had expressly covered. The Arkansas Supreme Court holds, United States Casualty Co. v. Johnson Drilling Co., 255 S. W. 890, that the words quoted contemplate emergency relief—such as must be given instantly or immediately following the accident to prevent impending death or to assuage or prevent suffering. "These words have no reference to such surgical and medical treatment and hospital charges and compensation for nurses and such other expenses as are incident to, and necessarily incurred in, the usual and ordinary treatment of the victim of the accident some time after the accident occurred and which are continued in order to restore him, if possible, to his normal condition, and by so doing to lessen the damages for which the person causing the injury would be liable."

WAS DEATH FROM FALL RESULT OF ACCIDENT OR DISEASE?

In an action on a policy insuring against injury by "accidental means," the Texas Court of Civil Appeals holds, Aetna Life Ins. Co. vs. Robinson, 262 S. W. 118, that if the insured slipped and fell upon the pavement, inflicting the injuries from which he died, his death would have been caused by "accidental means;" but if, because of a fainting spell, or some other bodily infirmity, he was caused to fall, thereby inflicting the injury, though the injury may have been the sole cause of his death, it would not necessarily follow that the death was occasioned by accidental means. If such an injury would naturally follow from a fall occasioned by a fainting spell or other bodily injury, not accidental in its nature, then the death would not be accidental within the meaning of the policy.

Where the evidence of expert physicians raised the issue that the insured's death might have resulted from apoplexy, it was held error to refuse to submit to the jury the issue whether apoplexy caused or contributed directly to the death.

EMPLOYER'S LIABILITY WHERE EMPLOYEE CHANGES HOSPITALS

The Illinois Supreme Court holds, Old Ben Coal Corp. v. Industrial Commission, 311 Ill. 35; 142 N. E. 507, that, while the rule in that state is that the employer has a right to prescribe where the medical attention and hospital services shall be procured so long as they are such as are reasonably necessary and adapted to the purpose of treating the injured employee, yet the employer does not, because the employee goes to another hospital, and thereafter demands medical and hospital services, avoids liability for such services without tendering other services of that character to him.

The fact that, as an emergency, the employer had the employee taken to a certain hospital, from which he was the next day taken by his family, does not, it is held, in the absence of competent service of that character after demand, relieve the employer from liability for such service.

EMPLOYER'S AGREEMENT FOR CONSIDERATION TO FURNISH MEDICAL TREATMENT TO EMPLOYEE NOT AFFECTED BY COMPENSATION ACT

Where an employer, though he has subscribed to the workmen's compensation fund and has complied with the law in relation thereto, agrees with an employee, in consideration of deductions from the latter's wages, to furnish the employee competent and skilled medical treatment for illness or injuries suffered in his service the West Virginia Supreme Court of Appeals holds, Ashby v. Davis Coal & Coke Co., 121 S. E. 174, that he is bound to maintain for that purpose a competent and skilled physician, notwithstanding the provisions of section 22 of the West Virginia Workmen's Compensation Law. Where the employer neglects to perform the duties so imposed and by reason of such neglect the employee is injured, such employer is liable in damages to the employee to the same extent that the physician would be were he sued for the injury.

CONTROL OF WARD IN MUNICIPAL HOSPITAL UNDER CITY CHARTER

In mandamus proceedings on the relation of the University of Cincinnati against the Director of Public Safety of the city, to require the defendant to cause to be made at the expense of the relators the equipment of ward C-3 for the purpose of surgical research, the defendant maintained that the power of setting aside a ward for surgical research or other hospital purposes rested in him as an official of the city, and was not vested in the directors of the University. The question was, since there could be no dual incompatible control of the matter, in whose hands was lodged the power of setting aside such a ward.

The Ohio Supreme Court held, State vs. Tudor, 143 N. E. 669, that under the city charter, V 1, 2, the administrative and executive control of municipal hospitals is still lodged in the director of public safety, while the medical work, teaching and nursing have been placed under the control of the university directors, and that the directors could not, by mandamus, require the director of public safety to equip the ward.

It was also held that the university directors could not, under the city charter, authorize private patients from whom compensation should be received to be taken into this ward, without the consent of the proper authorities.

ACUTE HEART DILATATION HELD WITHIN WORKMEN'S COMPENSATION ACT

The Maine Supreme Judicial Court holds, Brown's Case, 123 Atl. 421, that acute heart dilatation while shoveling snow from a roof is an accident within the Workmen's Compensation Act; and that, while the word "accident" is commonly predicated of occurrences external to the body such as wrecks, explosions, collisions, and other fortuitous mishaps, "an internal injury that is itself sudden, unusual and unexpected is none the less accidental because its external cause is a part of the victim's ordinary work."

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Cancer's Selfcontrol*

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The chief difference between the average benign neoplasm and the average malignant one is that the benign exerts more control over itself than the malignant. It cannot be said that any neoplasm has complete control of itself at all times, because the very fact that it grows shows that its control is not absolute, but fortunately for the human race, the majority of neoplasms do reach a point of absolute selfcontrol, or in other words, obey the law of the limitations of growth. Moles, warts, lipomas, myomas, and fibromas are good examples.

Benign neoplasms produce a structure in which the cells are practically indistinguishable from the cells of normal tissues, although the arrangement is somewhat different, and unquestionably a number of benign neoplasms function to some extent like the tissue they so closely imitate. An adenofibroma in a lactating breast will secrete milk, a myoma of the uterus will sometimes contract like normal uterine muscle if it is irritated with the point of a knife, and an adenoma of the intestine will secrete mucus.

All benign neoplasms, like the tissues which they imitate, produce regenerative cells as well as differentiated cells; otherwise they could not grow, because the differentiated cells do not reproduce. It is also reasonable to believe that the regenerative cells of benign neoplasms are more active than the regenerative cells of normal tissues, and that the regenerative cells of certain benign neoplasms are more active than the regenerative cells of others, because they grow faster than others. It may be that the regenerative cells of benign neoplasms are more numerous than those of normal tissues, and that the regenerative cells of some benign neoplasms are more numerous than those of others.

When benign neoplasms reach the point of complete selfcontrol, their cells either cease to regenerate, or they differentiate beyond the point of regeneration. If all the cells of a benign neoplasm have differentiated beyond the point of regeneration, there is only one thing left for the neoplasm to do, and that is to degenerate, and this probably often takes place, especially in myomas of the uterus. Degeneration seems to be one of Nature's methods of getting rid of neoplasms.

We are in the habit of saying that certain benign neoplasms are potentially malignant when, as a matter of fact, we have no proof that they are. It would be almost as reasonable to say that the lower lips of middleaged men are potentially malignant, because in the United States about one fourth of all epitheliomas are located on the lower lips of men. It is safe to say that most adults have at least one mole on the body, but the type of the epithelioma that often starts in a mole represents only about five per cent. of all epitheliomas. Only about one per cent. of myomas of the uterus become sarcomatous; therefore, neoplasms that show a malignant change in only one per cent. certainly should not be called potentially malignant.

In passing from benign to malignant neoplasia, the fact should not be lost sight of that the power of selfcontrol still exists, although to a gradually diminishing degree. A wart that has been growing slowly on the skin for a number of years may show evidence of increased rate of growth, and after it has been excised and examined under the microscope, cells are observed at its base that differ from those found at the base of the ordinary benign wart. They are larger, irregular, and hyperchromatic, and certain of them may show prominent nucleoli, and have invaded the adjacent structures. Such a group is immediately pronounced cancer. The regenerative cells at the base of this wart have undergone what von Hansemann called anaplasia, or a process of dedifferentiation.

MacCarty, in his studies on the histogenesis of cancer of the breast, observed the same type of cells in his secondary cytoplasia. These cells are still within the acini, but are indistinguishable from the cells of his tertiary cytoplasia, or definite cancer, in which the cells have broken through the socalled basement membrane. I believe that MacCarty's secondary cytoplasia is just as definitely cancer as his tertiary form, when found in the breast, the only difference being that the cells are still enclosed by the socalled basement membrane. These anaplastic or dedifferentiated cells appear to represent a new type, and are observed in all forms of malignant neoplasia, although they vary in shape and size in different types of malignant neoplasms. Sometimes cells that are indistinguishable from them appear in benign regenerative process, for example, in certain exophthalmic goitres.

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These anaplastic or dedifferentiated cells have various potentialities. I wish here to emphasize a good potentiality, or the power to produce cells that differentiate or reach a state of maturity beyond their ability to reproduce. This differentiating or controlling quality ranges from practically nothing to almost one hundred per cent. The cells of a neoplasm that show practically no tendency to control themselves, rapidly infiltrate the adjacent structures and, by utilizing the vascular system as a means of metastasis set up colonies in various parts of the body, which in turn keep on producing their own kind of cells, finally with a fatal result. On the other hand, if the cells of a neoplasm show a marked tendency to control themselves by differentiation, the neoplasm will grow slowly, and show very little tendency to metastasize; or if some of its cells do metastasize, they will in turn set aside the large majority to differentiate and build a structure similar to that found in a normal organ, which functions to some extent. The latter process is sometimes found in cancer of the thyroid, and if it were not in such a structure as a lymph node, one would be tempted to call it accessory thyroid.

Squamous cell epitheliomas control themselves by producing keratin, and if not keratin containing cells, cells that have differentiated beyond their ability to reproduce.

Basal cell epitheliomas control themselves by producing cells similar to the normal basal cells of the skin, melanoepitheliomas by producing melanin which is a product of the epithelial cells and indicates an attempt at selfcontrol. It seems like a paradox, but the blacker a melanoepithelioma, the longer the life of the patient. One patient observed at the clinic had had an eye removed on account of melanoepithelioma, fifteen years before. There were black lumps all over his body, which had been there for ten years. A black axillary lymph node was removed, and on microscopic examination the epithelial cells contained therein were found to be packed with melanin. Recent data concerning this patient have not been obtained, but he lived for ten years with general metastasis. I have never seen, and never expect to see a patient with a nonmelanotic melanoepithelioma, or the white blackberry type, that has lived ten years with general metastasis.

Masses of keratin are not uncommonly observed in lymph nodes produced by cancer cells, although no cancer cells are lying adjacent to it. It is reasonable to believe that these cancer cells controlled their growth by complete differentiation, thereby bringing on a spontaneous cure. It is also reasonable to believe that, if something can be discovered that will make malignant cell differentiate, we will have the key to the whole situation. This I believe is only possible in the hands of the chemist or physicist.

Malignant neoplasms need not necessarily be preceded by benign neoplasms; the large majority are not. Many are preceded by destruction of tissue, but others spring up without the slightest injury, so far as we know; the latter type should be called true spontaneous neoplasms. It would seem that this type can only be explained by heredity. Familiarity with the accurate and epochmaking work of Maud Slye makes such explanation conclusive. It is probable that a large proportion of the malignant neoplasms which we are prone to attribute to various types of trauma occur in persons who have inherited a tendency to malignant neoplasia. It is often said that cancer starts from one cell. This may apply to a small number of cancers, but by no means to the majority.

In studying epitheliomas, I have often seen multiple points of origin in the same neoplasm, and even the basal cells for a distance on each side of the main growth show malignant change, although they have not started to infiltrate. In diffuse cancer of the stomach, I have seen a large number of tubules in which the normal regenerative cells have changed to cancer cells, although they have not invaded the surrounding structures. It is common to observe a number of breast acini in the state of secondary cytoplasia, while in the same region, other acini are in the state of tertiary cytoplasia or definite cancer. It may be assumed that the malignant change that took place in the cells of the various tubules of the stomach, or in the various acini of the breast were activated by the same cause, so far as each organ was concerned, in other words, "the whole thing has gone crazy." (6).

In 1915 I began grading malignant neoplasms on the basis of cell differentiation, and during the following four years two thousand epitheliomas were intensively studied. Of this number 1,628 squamous cell epitheliomas were graded strictly from a microscopic viewpoint, on a scale of one to four and absolutely independent of the clinical histories. The basis of the grading, published in 1920, is as follows: "If an epithelioma shows a marked tendency to differentiate, that is, if about three fourths of its structure is differentiated epithelium, and one fourth undifferentiated, it is graded 1; if the differentiated and undifferentiated epithelium are about equal, it is graded 2; if the undifferentiated epithelium forms about three fourths and the differentiated about one fourth of the growth, it is graded 3, and if there is no tendency of the cells to differentiate, it is graded 4. Of course, the number of mitotic figures and the number of cells with single, large, deeply staining nucleoli (oneeyed cells) play an important part in the grading." The mitotic figures and the oneeyed cells are undifferentiated cells, and really should be considered only as such; however, when mitotic figures are numerous, especially if they are of an irregular nature, one is inclined to raise the grade to some extent.

I have previously published three papers on this subject (2, 3, 4), and now, after nine years of experience with the grading of epitheliomas, I believe that the system of grading should be slightly revised; that is, instead of a Grade 1 epithelioma in which about three fourths of the cells are differentiated and one fourth undifferentiated, should be substituted a Grade 1 epithelioma, one in which differentiation of selfcontrol ranges from almost one hundred per cent. to seventy-five per cent., and undifferentiation from almost nothing to twenty-five per cent.; a Grade 2 epithelioma, one in which differentiation or selfcontrol ranges from seventy-five per cent. to fifty per cent., and undifferentiation from twenty-five per cent. to fifty per cent.; a Grade 3 epithelioma, one in which differentiation or selfcontrol ranges from fifty per cent. to twenty-five per

cent., and undifferentiation from fifty per cent. to seventy-five per cent., and a Grade 4 epithelioma, one in which differentiation or selfcontrol ranges from twenty-five per cent to practically nothing, and undifferentiation from seventy-five per cent. to practically one hundred per cent. So far as an estimation of the ultimate result is concerned, this revision will have no effect on Grades 1 and 2, but will affect slightly Grades 3 and 4, because a small percentage of neoplasms, formerly classified Grade 3, will now be classified Grade 4. In other words, the most malignant of the Grade 3 neoplasms will be classified in Grade 4.

Up to November 1, 1924, after excluding the inoperable cases and the immediate postoperative deaths, complete data were obtained in 880 cases of graded epitheliomas.

Of the Grade 1 group, or cases in which there was from almost one hundred per cent. to seventy-five per cent. of selfcontrol, a good result was obtained in 90.20 per cent.

Of the Grade 2 group, or cases in which there was from seventy-five per cent. to fifty per cent. of selfcontrol, a good result was obtained in 62.16 per cent.

Of the Grade 3 group, or cases in which there was from fifty per cent. to twenty-five per cent of selfcontrol, a good result was obtained in 24.82 per cent.

Of the Grade 4 group, or cases in which there was from twenty-five per cent. to practically no selfcontrol, a good result was obtained in only 10.09 per cent.

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Precancerous Conditions About the Rectum*

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In looking over the statistics on the death rate from carcinoma, one is struck with the large mortality occurring in this disease among civilized races. This amounts to sixty to 151 for each 100,000 of the population (1), varying with the locality, and represents not only one of the largest single causes of death, but is relatively and actually on the increase all over the world. The official records of the New York State Department of Health show (2) that the death rate from carcinoma increased 29.8 per cent. between 1900 and 1915, and rose in this state from 32.3 to 104.8 for each 100,000 of the population during 1921. According to the United States Health Reports (3), the carcinoma rate has taken an upward trend in 1921, and is higher than for any earlier year in twenty-three of the thirty-four states for which it was tabulated. In trying to account for this increase it has been argued that it is more apparent than real, because many cases are now discovered which formerly remained unrecognized; that this argument is unsound becomes clear when we consider that the general death rate from other diseases has steadily declined in the same period,—in the case of tuberculosis this amounts to fifty per cent. in the past twenty years (4). The gastrointestinal tract seems to be especially vulnerable, showing an incidence of over fifty per cent. in mouth, stomach and rectum (5).

Various theories have been advanced to explain the pathogenesis of carcinoma; it has been asserted at different periods that it is due to an inclusion of misplaced embryonal cells (6), to a disturbance of the balance between epithelium and connective tissue (7), to a loss in the power of the differentiation of the cells (8), to an infective agent (9), to parasites (10 and 11), to heredity, drinking water, and many other causes too numerous to mention; none of these will account for its occurrence in every case, though such advances have already been made in the study of the disease that it has been produced experimentally in the laboratory (12, 13), and transplanted from one animal to another. Evidence deduced from a mass of clinical data points to the conclusion that it is attributable to no one single cause, and that identical factors are not present in all cases (14, 15). There is one outstanding feature common to a large group which has long been recognized; this is a tendency to occur in tissue which has been subjected to long continued irritation, persistent trauma or chronic inflammation. In some manner these produce a favorable soil for the implantation of cancer. Billroth gives it as his opinion that carcinoma almost never arises in the normal breast (16), von Bergman asserts that cancer of the skin without cutaneous lesions does not exist (17), and Ribbert holds that epithelial cells can never grow into connective tissue which has not been altered by injury (18). That these are important factors in malignancy becomes evident when it is seen how often its starting point is in certain inflammatory and hypertrophic lesions,—the precancerous state of Orth. The rôle which chronic irritation plays in the development of carcinoma is further emphasized in the studies of Murray, Leitch, Scott, Legge,

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Rowntree and others (19), which show that agents such as arsenic, paraffin, röntgen ray and other factors are capable of setting up changes which result in malignancy. The theory upon which this is based is that they cause protoplasmic disintegration in the course of which activating substances are produced which stimulate cellular growth and cause the formation of a typical gland structure. Clinically this is illustrated by carcinomatous degeneration which occurs under similar conditions in various parts of the body. For example, in the skin most growths of this type have their origin in warts, moles, nodules, ulcers, scaly patches, leucoplasic areas, etc., and when these are subjected to trauma or chronic irritation many of them become the starting points of carcinoma. Keen and Bloodgood report removal of moles which had become malignant in sixty-five patients. In seventy-six others they excised pigmented growths of the same type in the precancerous stage, in none of which there was a recurrence or death from malignancy (20). Leitch reports that the papilloma and epithelioma of paraffin workers is preceded by skin lesions. In carcinoma of the lip, tongue and cheek there is often a history of chronic irritation from the rough mouthpiece of a pipe, broken or jagged teeth, chewing of irritating substances. Carcinoma of the uterus most often begins in portions injured at childbirth, and has its starting point in cervical erosions, ulcers, cicatrices and hypertrophies, and as a matter of fact is very rare among women who have never borne children. Coley reports 970 personal cases in twenty-three per cent. of which local trauma from chronic irritation was the determining factor in malignancy (21). Smith quotes from the records of the Mayo Clinic, showing that sixty to seventy per cent. of carcinomata of the stomach begin in gastric ulcer, and Bland Sutton writes that malignancy of the gall-bladder is intimately associated with gallstones and biliary concretions (22).

Analogous conditions exist about the anorectal region which are likely to result in carcinomatous degeneration under suitable conditions. Neglected ulcers, fissures, cracks, postoperative wounds, chronic eczema of the anal skin, benign tumors which are kept in a state of chronic irritation from stool, scratching or friction from clothing, may when the time is ripe take on a malignant character. To quote from Sutton: "Some chronic inflammatory change often precedes anal carcinoma, such as piles or fissure, and it has been known to begin at the mouth of a chronic fistula" (23). Some years ago I saw a woman who had been operated upon for an anorectal fistula of long standing; three months after her operation clinical evidence of carcinoma developed in the scar, of which she died later. I operated upon a woman of middle age for a pedunculated growth which had existed ten years and had been diagnosed as piles because it protruded at stool, but gave no other symptoms except a severe grade of anemia. At the attached portion of the growth there was an ulcerated area the size of an apple seed, upon which the report of the pathologist read, "Adenoma strongly suspicious of malignancy." I resected a papillary tumor of the rectum in a patient of forty, who gave a long history of intestinal disturbance, protrusion and bleeding from the rectum. She has at this writing a thickening of the wall and infiltration which appear to be a recurrence of her trouble, although the pathological findings are negative for malignancy. It is well known that many cases of polyposis of the colon and rectum ultimately undergo a malignant change, fifty per cent. according to Ewing (24), while Lockhart Mummery states unreservedly that multiple adenomata are definitely precancerous, all of them eventually undergoing a malignant change (25).

In the past six years I saw three cases of colitis polyposa in all of which there had been a history of rectal trouble lasting over a period of years. In two of these patients carcinoma of the colon developed and the patients died, the third is still living in a hopeless condition from general carcinosis. One of these was a man under thirty, who suffered from ulcers of the bowel with a discharge of mucus, pus and blood for a number of years. When he came under observation he showed a rapidly increasing number of papillary tumors and died two years later of carcinoma of the sigmoid. It appears probable that his original ulceration was a benign condition which from chronic irritation resulted in the precancerous adenomata. Mayo reports forty-two cases of diverticulitis of the large intestine, in thirteen of which carcinoma coexisted, and draws the conclusion that infection, irritation and trauma established the precancerous condition (26). Infestation with bilharzia hematobia has been found to be the cause of vesical and rectal tumors in tropical countries, and Ferguson reports forty cases of this nature (27). Exner cited by Pennington records one case in which pile tumors assumed sarcomatous degeneration (28). One could quote other instances of this character from the literature, but it must be quite clear by this time that innocent lesions of the anorectal region not infrequently undergo malignant change. For convenience they may be set down in the following grouping:

1. Any indolent sore, erosion, crack, fissure, ulcer or wound which in the absence of unfavorable constitutional conditions fails to heal within a reasonable time should be looked upon with suspicion. This is especially true when it occurs at the rectosigmoid or mucocutaneous junction, at the base of one of the valves, the point of attachment of supposedly innocent growths, about folds and situations where there is an abrupt change of structure, or locations where it is exposed to repeated bruising.

2. Benign neoplasms which are soft, highly pigmented, multiply in great numbers, grow rapidly, extend steadily, recur after removal, have a tendency to grow on a broad base rather than an elongated pedicle, must be regarded as potentially malignant.

3. Any long standing irritative disease or process about the rectum such as fistula, diverticulitis, the skin changes which follow chronic anal pruritus, perianal dermatitis or eczema, leucoplasia, stricture and prolapsed rectum may in time acquire malignant characters.

4. Inflammatory lesions due to syphilis or tuberculosis may have carcinoma engrafted upon them. As early as 1872 Hutchinson recognized that certain syphilitic lesions of the mouth were precancerous.

5. Malformations and congenital tumors may occasionally, though rarely, become malignant.

CONCLUSIONS

1. There is good ground for the belief that carcinoma does not arise from normal tissue.

2. Benign growths and pathological processes of the anorectal region are favorite sites for the development of malignancy.

3. The removal of these in an early stage is a truly preventive treatment of cancer.

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Influence of Pulmonary Tuberculosis on the Evolution of Pregnancy and the Offspring

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Out of a total of thirty-five cases reported by Sakka in his thesis (Paris, 1918) there was not a single miscarriage; there were seventeen full term labors, four at eight months and a half, ten at eight months, two at seven months and a half, and two at seven months. Out of a total of twenty-two cases reported by Grisolles, there were seventeen labors at term, three at eight months, and two miscarriages at four months. Of twelve cases recorded by Dubrenith, ten labors took place near term; the other two patients miscarried. Proust gives the following statistics from the Charité Hospital, from 1898 to 1902. Of fifty-two women, thirty went to term, four to eight and a half months, two to seven and a half months, four to seven months, and one miscarried at five months. Hence it would appear that in maternal pulmonary tuberculosis, premature labor is as frequent as full term labor, and that miscarriage is infrequent.

Experimental data are similar to clinical results. In female animals inoculated before fecundation, Landouzy found that gestation usually went to term, while in females inoculated during gestation, the evolution of the pregnancy varied with the time the inoculation was made and especially with the virulence of the bacillus inoculated. The animals rarely miscarried. Most observers maintain that tuberculosis has little influence on the evolution of pregnancy.

As to the offspring being born with tuberculosis, one must consider two questions, namely, hereditary contagion and hereditary predisposition. Direct transmission of the maternal tuberculosis to the fetus does occur, although exceptionally, and has been demonstrated by clinical data, likewise experimentally. Landouzy and Martin inoculated pregnant guineapigs with the organs of fetuses issued from tuberculous mothers and in some cases bacilli were found in the viscera of the young animals and in the umbilical vein. Other experiments carried out by Aviragnet, Londe, and Thiercelin with placentas from tuberculous women, by Bar and Rénon with blood from the umbilical vein, and by Herrgott with the amniotic fluid, have been positive.

How does infection take place when the fetus is born tuberculous? It may be derived from the mother from infection of the ovum, but as Strauss has pointed out, this is a hypothesis difficult to prove or even to accept, although it cannot be discarded. In order to be accepted one must admit that the presence of the bacillus or its toxins within the ovum will not prevent fecundation or migration of ovum during the entire embryonal life.

If infection takes place during the fetal period there may be transplacental contagion in which case the mother must present a bacillemia, which is not the rule in pregnancy. It is only after labor that tuberculosis becomes aggravated and generalized.

Then again, for infection to take place during gestation the placenta must be permeable to the bacillus and some observers maintain that such is the case upon the condition that the epithelium of the villosities is pathologically changed. Landouzy even suspected that the bacilli could pass through the placenta without leaving any trace of this passage.

Then there is the question of placental tuberculosis. Of thirty-two placentas from tuberculous women, Schmorl found distinct bacillosis in fourteen; Schlimpert in four out of seven, and Bar, four out of twelve. Nevertheless it must be admitted that this is a rare condition and hard to detect. In these circumstances placental infection of the fetus may occur if, as Bar points out, the placenta be regarded as a tuberculous abscess which being squeezed by the contractions at the end of pregnancy, and during labor, forces the bacilli immobilized in the intervillous fibrinous masses into the fetal circulation.

The possibility of infection of the ovum by the father has as yet not been proved clinically or experimentally. Hence, one may conclude from both clinical and experimental data that congenital tuberculosis is unquestionably rare, and that in the majority of cases the fetus is born intact.

Now, although the fetus is not born tuberculous in the bacteriological sense of the word, it is predisposed. The offspring of phthisical parents inherits cells which react quite as badly as those of the parents against tuberculosis infection. The offspring has inherited, not the tuberculosis, but the aptitude to contract the disease. Therefore, the heredity of soil—hereditary predisposition—is at present generally accepted. It is above all the future of children born of tuberculous mothers that seems favorable to this theory.

As to the future of the offspring in Sakka's thirty-five cases, ten died in hospital, nine were discharged in a mediocre condition, while sixteen were in good health. Among the ten that died, one died a few hours after birth, three were at seven and seven and a half months term and were put in an incubator, one was born dead, while the remaining three died within ten days after birth.

Voron's statistics covering six years at the Lyons Maternity, show that sixty-eight per cent. of the offspring of tuberculous mothers had died. Planchu and Gardere, of Lyons, came to similar conclusions. According to Ascoli, fifty-five per cent. die during early infancy, of which thirty-three per cent. die from tuberculous meningitis. Hamburger gives a proportion of twenty deaths out of fifty-one infants.

Although low, the value of the product of conception is far from being negligible. In point of fact, Voron's statistics show that thirty-two per cent. of the offspring were alive six years after birth. It is also evident that the future of children born of phthisical parents must largely depend upon the social situation of the latter.

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Chronic Intestinal Stasis in Epilepsy*

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In the study of epilepsy it seems clear that whatever the actual exciting element the vascular system is the main source of the epileptic phenomena, either alone or as a carrier of toxic agents, and the work that has been done experimentally by the advocates of both views has been very considerable in the last twenty years. Cells cut off from their circulation, even momentarily, show a reaction towards acidity, and this acidity factor must not be lost sight of in the interpretation of the experimental results recorded by the mechanical and vascular theorists. Faradization and epinephrin will also blanch pial vessels and produce epileptiform convulsions. The proteoses of Cuneo, to be presently described, have the same effect when painted on the cortex. Lastly, lactic acid given intravenously will also produce convulsive seizures. Acidosis, therefore, whether produced locally or remotely, would appear to play a considerable rôle in the production of the epileptic convulsion, and the work of Cuneo (1) during the last nine years at Genoa goes perhaps further than that of any other investigator to establish its importance.

Cuneo established the presence, in the blood of persons who had just had an epileptic seizure, of a substance which he identified with the proteoses, and this substance introduced intravenously into animals faithfully reproduced the epileptic phenomena. At the same time he showed that the urine of these persons contained an extraordinarily high percentage of organic acids. Other features were a retention of total nitrogen, an increase in the nitrogen content, and continuous acidity of the feces. Comparative tests in epileptic groups with a protein rich and with a carbohydrate pure diet next gave unexpected results, the acidosis in the former group being reduced, with a corresponding improvement in the severity and number of the fits, while there was a percentage increase in acidity in the second group, and the fits increased in number and severity. It was next established that the fault in the starch metabolism occurred in the first stage of conversion to the disaccharides, maltose, lactose, cane sugar, etc. Normally this takes place through the action of the amylolytic ferments, the subsequent conversion of maltose being effected by maltose ferment through hydration into glucose. The failure in the first stage resulted, in the absence of sufficient amylolytic ferment, in the production of a more or less intense concentration of organic acids—acetic, butyric, lactic, tartaric, etc.—and these, which should normally

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have been united with alkaline bases in the small intestine, passed in the epileptic into the blood stream and urine unchanged. The alkaline salts in normal individuals are oxidized—if ammoniacal through carbonate of ammonia into urea, if sodium into sodium carbonate, and this is the vitally necessary salt for maintaining the alkalinity of the blood and tissues. Cuneo concludes from his work that this transformation of organic salts into sodium carbonate begins in the mucosa of the small intestine and is completed in the liver, whence the sodium carbonate is returned to the gut with the bile. Lack of bases favor the production of acidosis, while a sufficiency of sodium tartrate favors the activity of the liver ferments and the production of sodium carbonate. If sodium acetate or tartrate is introduced directly into the circulation it causes typical epileptic convulsions, and Cuneo was able to remove from the carotid artery of the animals used a substance which proved to be a proteose.

The source of these proteoses Cuneo found in the reduction of that fundamental constituent of all cellular nuclei, nucleohistone, and in the case of the serum and leucocytes of the blood also this reduction takes place under conditions of acidosis due to the concentration of organic acids. In an acid medium he was able to demonstrate the reduction of nucleohistone from both these sources into an innocuous acid and a toxic base having the chemical and biological properties of nucleinic acid and of proteose. Introduced intravenously in dogs the latter not only produced typical epileptic convulsions, but the postmortem appearances in dogs dying in status epilepticus so induced were identical with those found in the viscera and the brain and its coverings in persons dying of proteosemia (albumosemia), and as described by Tanzi and Lugaro in their findings in patients who died in typical status epilepticus.

He believes that albumosemia exists in epilepsy and that this is caused by an insufficiency of the alkali forming function in the liver and the small intestine so that the acid organic salts, which are transformable into sodium carbonate, do not undergo this metabolic change, but enter the circulation and cause a division under certain conditions of the nucleohistone element and the nucleoproteids into nucleinic acid and proteoses. These latter remain free and exhibit their convulsive action.

Localized acidosis in derangements of the circulation may also set free albumoses, or it may be other toxins, as in Jacksonian seizures; and in the convulsions associated with craniocerebral injury with scar adhesions, brain abscesses, circumscribed areas of encephalitis, brain tumor, cysts, general paralysis, cerebral arteriosclerosis, the acidosis produced by interference with the vascular supply, may as suggested by Osnato (2), determine the release of proteoses locally in cells cut off from their circulation, and so excite the convulsions associated with these conditions. In general paralysis and arteriosclerosis, and probably also in encephalitis, the vascular disturbances and the local cellular destruction processes in the brain elements are ideally combined to produce generalized convulsive seizures.

A little over two years ago it was my privilege to address you on the possibility of proving a close connection between epilepsy and chronic intestinal stasis. More recently I have published a preliminary report (3) on a small group of epileptics treated on lines directed exclusively to the relief of the gastro-intestinal conditions found associated in these patients with the epileptic phenomena. Today, thanks to Cuneo's researches, I find myself in a stronger position to press the importance of chronic intestinal stasis as a factor in the pathogenesis of epilepsy. I have had opportunity of studying in very great detail twenty-seven cases of epilepsy. In all of these a full personal and family history was obtained, and each patient was examined, system by system, for indications or history of chronic toxic conditions. The blood, menstrual blood, urine and stools were examined, and the condition of the uterus, urinary bladder, teeth, tonsils, nares and sinuses investigated. Thirteen cases were x rayed with bismuth meal and barium enema, and eight of these were operated upon for conditions of advanced stasis affecting the general health. In every epileptic examined the clinical and laboratory evidence was eloquent of considerable chronic intestinal stasis and widespread mucosal catarrh of the intestine, as described first by Lane. As in the early group reported treatment has, in every case, been directed primarily to the relief of the intestinal condition.

Of the twenty-seven cases examined, only twenty can be reported upon as still under my personal supervision, and of these five are not yet sufficiently long under treatment to enable me to include them in any statement of results. I can, however, report on fifteen cases sufficiently long under treatment to be included in such a return.

In five cases there has been complete arrest of epilepsy over a period of from one to three years. Three other cases show immunity over a period which just fails to bring them into the same category. Three cases show a lengthening interval and decrease in severity of the attacks. Three cases show no improvement at all, including one with some injury to the scalp from burns. One patient died from pulmonary embolus following operation. When it is remembered that bromides and luminal have been excluded from the treatment, and that the carrying out of my instructions has been in many and various hands, I think I may fairly claim that the methods of treatment I have adopted have yielded results which go some way towards proving a close association between demonstrable chronic intestinal stasis and epilepsy.

The following points have emerged in the examination of cases. The feces were examined in all for intestinal parasites and their ova, with negative results. Fourteen cases showed undigested starch in excess, and practically all cases showed an acid reaction in the feces. Bacilluria occurred in fifteen cases, albumin in four, sugar in one, and the average total acidity of the twenty-seven cases was considerably above normal. The blood pressure readings varied: under 100 mm. four; under 110 mm. two; under 120 mm. six; under 130 mm. five, under 140 mm. two; 150 mm. or under, four. So that the average was 121.4 mm. The pulse pressure averaged 43.2 mm. Of eleven females four showed definite goitre, and four marked amenorrhea. Tonsils were found enlarged and septic, or had been

already removed, in twelve cases. In one case a suppurating antrum had been treated. Sixteen cases gave definite evidence of chronic catarrh of mucous membranes other than the gastrointestinal tract. Enuresis was reported in four cases; sleepwalking in four; urticaria in seven; stammering in three; migraine in three; asthma in one. A family history of epilepsy was found in eight; stammering in eight; asthma in three; migraine in three; urticaria in two; chorea in one. In no case was a syphilitic history obtained either in the patient or in the parents. In two cases the parents were first cousins. Congenital defects or malformations were found in five cases; undescended cecum in one; maldevelopment of the genital organs one; persistent deciduous teeth one; hypoplasia of enamel two; impacted molars two; there was a personal history of active tubercle in childhood in one patient, and in one case the family history showed tubercle, involving three members of the family, whilst in another case there was a family history of chronic alcoholism in the father.

The results of treatment generally have been, I think, encouraging; and, if all the operational cases have apparently not done better than the unoperated group, it must be remembered that these were cases calling definitely for operation on the grounds of intestinal stasis alone, and further, that with the two exceptions where colectomy was done, the removal of a controlling appendix and acquired bands or adhesions still left the edematous, turgid, congested, and perhaps denuded mucosal surfaces for aftertreatment. Were not colectomy so dangerous an operation I should be inclined to resort to it more frequently in epilepsy, but as a general rule the treatment of patients not operated on, or otherwise operated on, is necessarily prolonged, and results cannot be expected at once in cases of longstanding chronic mucosal catarrh. Yet the immediate cessation of epileptic attacks from the date of operation in several cases has been a very striking experience.

There is much to investigate in every individual case, besides the degree of involvement of the colonic tube. The extension of the chronically catarrhal and infective processes to the duodenal and upper jejunal area, and to the stomach, is a common feature in all cases of intestinal stasis at all advances, and it is this extension which links my observations with those of Cuneo. I believe that the leaking septic tank is the first cause of epilepsy, and that the later involvement of the small intestine and liver in chronic intestinal stasis is the next step towards the failure of the alkali reserve which Cuneo has described. And I further believe that the graver the involvement of the mucous membranes of the body generally, but particularly of the colon, in the chronic catarrhal processes, the greater the output of organic acids and the more profound the demineralization of the tissues and cells of the body. Acidosis is the feature of epilepsy, and is associated with persistent acidity or hyperacidity of the feces and urine. In the presence of such an acidosis the destruction of the nucleohistone of *mucosal cells* is constant and widespread, and proteosemia results on a large scale independently of the actual pressure of organic acids in the blood stream itself. I am confirmed in this view by the constancy with which my patients attribute their attacks to indigestion, to constipation, or to the presence of offensive stools, and by the good results of a return to sound habits of colonic hygiene. It is also my experience that the more chronic and extensive the colonic catarrh, the more grave the epilepsy in severity and frequency. Moreover, the more rigorously the system of treatment is carried out the more rapid and complete the improvement. This treatment is directed to the restoration of the function and amenity of the gastrointestinal tract, and particularly to the reduction of the septic catarrhal process; but no treatment will prove successful which does not also provide for a vitamine rich diet, for remineralization, for endocrine and general hormone reinforcement, and for the removal of septic processes wherever recognized. Where surgical relief of stasis is obviously necessary it must be carried out.

The part played by heredity is still a matter of dispute, but the figures I give in my own small series are sufficiently striking, not alone for epilepsy but for the closely allied explosive conditions—migraine, stammering, chorea, asthma, and urticaria. Sargent reviewed over eighteen thousand cases of craniocerebral wounds with skull defect resulting from war injuries. Of these in about eight hundred only, or four and five tenths per cent., epilepsy developed. I have, in the last five years, made a complete clinical and laboratory examination of not less than five hundred cases of typical chronic intestinal stasis; yet of these only twenty-seven have shown any signs of epilepsy, say five per cent. In these five hundred cases are many showing varying degrees of other nervous conditions—nervous exhaustion, phobias, borderland cases, dementias, sclerosis, etc. But unless the vulnerability of the cortex to certain specific toxins in certain individuals or families is accepted, we have no other explanation for the very occasional appearance of epilepsy in a condition so common as acidosis.

All of our present experimental methods of inducing epileptiform convulsions in laboratory animals, such as faradization, artificial anemia or acidemia, painting the cortex with epinephrin or proteoses, etc., fail to explain the general immunity of the vast majority of persons to the epileptiform convulsions so induced in laboratory animals. I, too, like Osnato, am convinced that it is on the lines of Cuneo's work that the great advance is to be looked for. My own work on stasis offers, as explanation of the failure of starch reduction in the small intestine which he has described in epileptics, the fact that extension of the catarrhal processes to the upper small intestine from the colon is due to mechanical obstruction at the ileocecal entrance and at the duodenojejunal junction secondary to overloading of the static colon. A further factor must surely be the subversion of the hepatic functions by the high acid and toxin content arriving by the portal channel. There is, however, this also to be said. The destruction of mucosal cells in the colon on a wide scale in stasis releases into the vascular system toxic agents, which, coming from such an origin, must have a specific affinity for mucosal cells at a distance. Only thus can we explain the frequency and the chronicity of catarrh of remote mucous membranes, nasal, bronchial, uterine, which is so constant a feature in chronic stasis cases, and which

proves so intractable until the main colonic reservoir of these toxins is overhauled and repaired. Closer study of the leaking septic tank will yet yield a most fruitful contribution to medical science, and a further step to the solution of many problems hitherto accepted as insoluble. These will almost certainly include a large proportion of chronic functional disorders within the province of neurology and psychiatry, and with them the problem of epilepsy will certainly be advanced definitely nearer to complete solution.

I have to acknowledge gratefully the loyal support and cooperation of the many general practitioners who have carried out my suggestions in treatment, and the staff of the various hospitals and homes where operations have been performed. To Dr. A. C. Jordan and to Sir W. Arbuthnot Lane especially, my thanks are due for the great skill and interest they have shown in the x ray and operational sides of the work.

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Pathological Impulses or Currents

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This is a sort of epitome of conclusions growing out of studies of the nasal ganglia by nerve blocking methods, and upon which studies certain publications have been based (1, 2, 3, 4, and 5).

An impulse originating in a nasal bloc may travel to, and be registered in, remote parts of the body in the form of pain or other pathological phenomena. That impulse, whatever it is, is the subject of this article. For the present it will be called simply a pathological impulse.

The evidence of the existence of such an impulse is like the evidence of the existence of electricity —it is known only by its manifestations.

Now it is a well known fact in physiology that cocaine, or other local anesthetic, may be applied to the trunk of a nerve, and that this effectively blocks the passage of all impulses till the effect of the anesthetic has passed away. It is also well known that when a local anesthetic is applied to a nerve that is transmitting a sensation as of pain to the brain or centre of consciousness, the pain is blocked off. This is what occurs when after a tonsillectomy (1) the pain from the tonsillar region is blocked off by cocainizing the nasal ganglion. The pain from the tonsil is transmitted via the nasal ganglion to the centre of consciousness, and all one has to do to arrest it is to cocainize the nasal ganglion, i. e., the nerve between the locus of distress and the brain. But in the case of say a traumatic corneal ulcer, the pain of which can also be arrested by cocainizing the nasal ganglion, the process is quite different. The pain from a corneal ulcer is not transmitted to the centre of consciousness via the nasal ganglion: for if it were, one would only have to cocainize the nasal ganglion to anesthetize the cornea, which is not the case. Indeed the cornea is quite as sensitive to the application of an irritant with the nasal ganglion under profound anesthesis as without. So that we can put this down in our frame of reference: pain from the cornea is not transmitted to the brain via the nasal ganglion.

And yet, as above indicated, the exquisite pain of a traumatic corneal ulcer can be completely blocked off and the eye made quite comfortable by cocainizing the nasal ganglion of the same side. This phenomenon calls for an explanation.

In connection with a traumatic ulcer of the cornea, it is worthy of note that in some instances a considerable corneal trauma may be sustained with little pain, whereas in other cases, slight trauma is followed by intense pain. I recall the case of a negro (2) who was driving a metal pipe into the ground with a hammer when a piece of metal dislodged and struck him in the eye. Presumably it went through the cornea, for it left no trace in the sclera, and it lodged pinioning the iris to the crystalline lens. It could be seen quite plainly as a bright object in the iris, close to the margin of the pupil, which was a little distorted. And yet it was all so painless that he did not seek medical aid for a week and when he did, it was because of what he *saw* rather than what he *felt*. There was no photophobia and no inflammation, and the boy was using his eye apparently without discomfort, but as he expressed it, he could see something in it. This represents a case of extreme trauma with a minimum of pain.

On the other hand, a party was out on a picnic. One person stepped on a twig and it struck another in the eye, making a microscopic abrasion of the cornea. This became quite painful in a few hours, but (and this is important) the pain was easily blocked off and the eye made comfortable by cocainizing only the nasal ganglion.

Again, a case of iritis, cause unknown, was under treatment. It was found that the pain could be readily blocked off and the eye made comfortable by cocainizing the nasal ganglion of the same side. But the relief lasted only a few hours, ususally three to five. Now, the patient discovered for himself that when he slept on the affected side his nose "corked up" and that whenever his nose "corked up" his eye grew worse.

Putting all of these phenomena together, phenomena which are not accidental or occasional, but uniform, and can be checked up by any one, the conclusion is forced that the pain in these cases is

augmented by something being sent to the locus of distress via the nasal ganglion. It is that something which in this connection is referred to as a pathological impulse; pathological because it emanates from a locus of pathology, and because it augments, or possibly under some circumstances initiates a pathological disturbance at the locus of registration.

I have referred to the case of the traumatic ulcer of the cornea as an instance in which the proof is definite and positive that the pain is not transmitted to the centre of consciousness via the nasal ganglion. Another case will illustrate it possibly more forcibly. Mr. R. (3) working in a planing mill had his fingers so mangled that one had to be amputated; and the case was followed by infection, and became quite painful. Now it was found that the pain in this case could be blocked off at the nasal ganglion of the same side, and the hand made comfortable, which invariably lasted two or three hours—during the life of the cocaine. Here again was proof that the pain of the hand was not being transmitted to the centre of consciousness via the nasal ganglion, for after blocking it off, the hand was still quite sore, and sensitive to pressure, which would have not been had the pain been passing the nasal ganglion. And the way blocking the nasal ganglion gave relief was by keeping something away from the hand,—something that was augmenting the pain,—a pathological impulse.

Another instance. Mrs. W. (4) was suffering from cancer of the uterus. It was far advanced, inoperable, and the end was being awaited, which came some two months later. But she also had a nose trouble and in attempts to give her relief for some of her nasal symptoms, the left nasal ganglion was cocainized, when it was found that that arrested the uterine pains, which at this time were radiating up the back and down the lower extremities. But blocking off the pain did not block off the uterine soreness, which was as acute as before.

With this evidence in hand, it would seem that the proof of the pathological impulse being an entity is established. It now remains to note some further phenomena in connection with it.

There seems to be no reason *per se* why a pathological impulse might not originate in various parts of the body, as perhaps they do; but as yet the proof is limited to the nasal blocs.

If, and since, pathological impulses originating in a nasal bloc may be propelled to and registered in almost any part of the body, the question naturally arises, why does a given impulse go to, say the right knee, when it could go to the left wrist? Why a cough, when it could be a sneeze? Or a cough today and a sneeze tomorrow? Why arthritis, when it could be neuritis? or lumbago? or asthma? or headache? Is it the nature of the impulse that makes it go to a certain place? or the reception offered it? Perhaps the final answer to that question is locked up in the future, but we have already some strong presumptive evidence. And all evidence points to the interpretation that a local pathology attracts a pathological impulse. For instance, Mr. G. contracted sciatica in the right leg. For three days or so, he was almost *hors de combat*. During this time he stumbled and came near falling, and in his attempts to regain his balance strained his left leg. Immediately the pain left the right leg and took up its abode in the left leg and he was laid up with sciatica of the left leg for two months. It would appear from that that the strain incident to the stumble put the left leg in a receptive mood and that the impulse was attracted accordingly. Again, in the case of

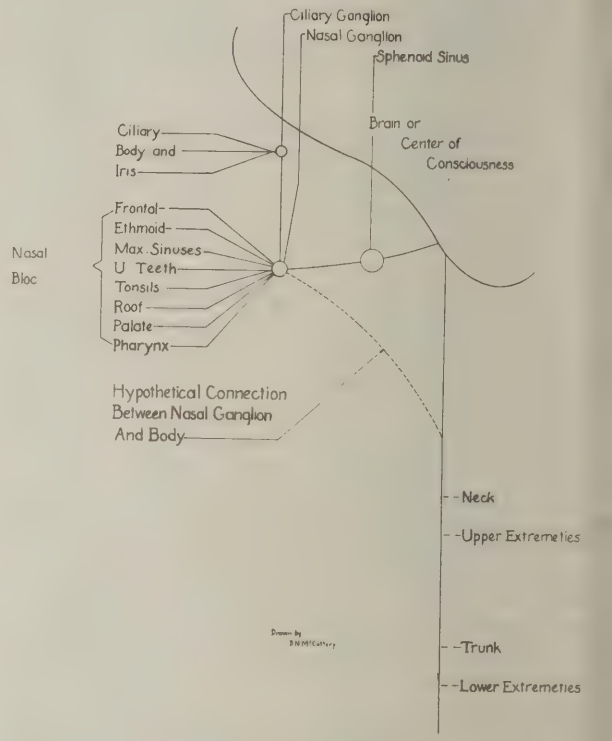

Fig. 1.—Diagram showing course of disturbances originating in a nasal bloc.

traumatic corneal ulcer above referred to, and this is only one of many such cases that have come under observation, there was evidently a loose impulse, too weak, perhaps, to excite symptoms *per se* but quite strong enough to drive a corneal ulcer into agonizing pain.

The other case above referred to, Mr. R., who sustained the loss of his finger, and a subsequently infected wound, is a striking instance of a local pathology attracting a pathological impulse. Mr. R. was known to have rheumatic pains from time to time, and during the prevalence of this painful hand he had no rheumatism. Possibly the entire pathological current spent itself in its concentration about the hand. It is a common phenomenon in the case of rheumatics that sustain an operation—that the rheumatism abates during the period of convalescence from the surgical disturbance.

Since the nasal ganglia are the points at which these pathological impulses may be arrested, it is important to know just what structures may transmit pathological impulses via these ganglia. We have only to turn to the anatomists for answer. The terminal branches of the nasal ganglia, right and left, are distributed respectively to the mucosa of the right and left nasal cavities and paranasal cells (with the exception of the sphenoid) tonsils, upper teeth, eustachian tubes, roof, palate, and pharynx. These regions I have referred to collectively as the nasal blocs.

The accompanying figure, which is partly hypothetical, and wholly diagrammatic, illustrates what happens when a disturbance originating in a nasal bloc, reaches proportions that impel escape. The nasal ganglion corresponds with a high degree of accuracy with the central office of a telephone exchange. It is the central station for the entire bloc. It is also the long distance station for regions beyond, as the eye, the sciatic nerves, the uterus.

The nasal ganglion, it will be observed, has direct communication with the brain and so all loci in the nasal bloc have easy access to the centre of consciousness. But these several loci have communication with other parts of the body, via the nasal ganglion, but not via the centre of consciousness. The ethmoid, for example, has a nerve communication via the nasal ganglion, and the ciliary ganglion to the ciliary body and iris. It also has communication with the shoulder and arm, via the nasal ganglion, but the rest of its path I know not.

Circuits.—The right and left nasal blocs do not seem to communicate above the neck, for pain or other disturbances in the region of the face and head can be blocked off only from the same side, but each nasal bloc seems to have open communication with both shoulders, arms, all parts of the trunk, and both lower extremities, even to the toes. Sciatica may be blocked off from the same side, or from the opposite side, as the case may be. Thus we seem to have two complete nasal circuits, a right and a left; the right including the right nasal bloc and the entire trunk and extremities, and the left including the left nasal bloc and the trunk and extremities, the two circuits overlapping throughout the trunk and extremities, but separate in the nasal region. From this it is seen that a pathological impulse, as lumbago, for example, may be emanating from the right nasal bloc or from the left, and the only way of telling which is by the blocking test. It is further conceivable that there may be other circuits, as an infected gallbladder, or kidney, or intestinal adhesion. As yet we have no light on such circuits except what we get from inference.

Growing out of this anatomical structure and these nerve blocking phenomena the author formulated the following law:

A disturbance originating at any point in the nasal bloc may be transmitted to any other point in the bloc, or to regions beyond, but in so doing it must pass via the nasal ganglion of the same side, and can accordingly be blocked off at that point.

Another question that is persistent in its demands for an answer is whether a pathological impulse can initiate a local pathological condition. That it can augment one, there is not the slightest doubt. And when a local pathology is augmented by the advent of a pathological current there is a vicious circuit set up, in which each tends to accentuate the other. But whether it can initiate one, might be an open question.

Mr. W. had a nasal disturbance that was resulting in rheumatism of the right arm—rheumatism or neuritis—at any rate a pain—which could readily be blocked off from the left side. It was found that after removal of a part of the right middle turbinate that was impinging on the septum, the pain abated except when he mowed the lawn. At such times the pain would return. It could still be blocked off, however. In this case it would seem that there was a residue of current still lurking about in the nasal bloc, but not enough to excite pain. When, however, the toxins of fatigue were added to the arm, then the combined effect of the toxins and current was sufficient to induce pain. Indeed it is conceivable that in the presence of rather strong current that an extremely slight local disturbance is sufficient to attract the current and this in turn to augment the local trouble, and thus pull harder on the current, etc.

I have seen this interpretation supported again and again by a patient with a known pathological current who finds that while lying in bed on the back, pain in the knees may be excited by straightening them out so that the muscles are taut, while flexing them gives relief. That it was emanating from the nasal bloc has been again and again checked up by blocking. It is a common expression among people that a draft on the back will put the shoulders to aching. I have seen this occur, just the chilling being sufficient to attract enough current to assert itself, and have then checked up the results by blocking off the pain at the nasal ganglion. So that it seems certain that minor local disturbance is quite sufficient to attract any loose current that might be abroad and thus initiate a set of symptoms that gradually gather momentum.

Causes.—It need only be mentioned that pathological impulses may emanate from an abscessed tooth, an infected tonsil, or a sinusitis. But it should be emphasized that pathological impulses may emanate from a sinusitis where there is no evidence of infection (3). There is still another group of cases in which the most painstaking examination using all the devices at our disposal fail to discover a pathological lesion in the nasal bloc and yet which are suffering from pathological impulses that emanate from the nasal bloc as shown by the fact that they can be blocked off. That monumental work of Sluder and Wright on the pathology of the nasal structures I think throws light upon such cases. Wright says: "It would probably be difficult to find an adult individual in a temperate or cold climate who does not present an example of this bone change within his nasal chambers, which we have a right to call pathological. It is only exceptionally that the symptoms to which it gives rise are sufficient to cause him to seek relief. When, however, it causes bony occlusion of a nasal fossa by means of a spur or deviation, when it stops up an ostium of an accessory nasal sinus and prevents proper drainage, when it impinges on a branch of a sensitive nerve or involves its peripheral distribution marked symptoms and a long train of the consequence may ensue." From this one would expect to find cases suffering from nasal disturbances that defy, during life, minute interpretation. It is such cases as these that are referred back from the rhinologist with a negative report, and which cases a little adroit nerve blocking will often clarify.

Treatment.—Treatment will not be considered in this connection. What is sought is a more perfect understanding of the principles involved; this achieved, the line of treatment will at once become obvious.

SUMMARY

1. Pathological impulses are, within the meaning of this article, real entities.

2. Pathological impulses may originate in either nasal bloc (or possibly elsewhere), from whence they are, or may be, transmitted to the remotest parts of the body.

3. Pathological impulses, it is conceivable, of such low amperage as to produce no appreciable effect, may be abroad in the body.

4. Pathological impulses are attracted to pathological loci, wherever such loci occur on the circuit of the impulse.

5. A pathological impulse attracted to a pathological locus cooperates with the latter in establishing a vicious circuit.

6. It is conceivable that a pathological impulse may take advantage of a slight impairment, such as fatigue, or momentary chilling of a part, or slight strain, to insinuate itself in and thus set up a vicious circuit.

7. A pathological impulse originating in either nasal bloc is not transmissible to its fellow of the opposite side, but is transmissible to both shoulders, arms, and trunk and to both lower extremities.

8. Pathological impulses have, in my experience, been definitely connected with a large number of phenomena.

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NOTES

1. It has been routine practice with me now for some time to block off the throat distress at intervals after removal of tonsils. The relief that it gives is very complete and the gratitude of patients for such relief is unbounded.

2. and likewise 3. are among my records but unreported.

4. This case was in the practice of Dr. English, of Palmetto, Fla. A diagnosis of cancer of the uterus with metastases had been made something like a year before. At the first time I saw her some two months before death, she was confined to bed, and kept more or less continuously under the influence of opiates. After it was discovered that cocainizing the left nasal ganglion relieved her pain, she preferred that to opiates and as a result I saw her almost daily till she became moribund. At first I used eight per cent. cocaine for blocking the nasal ganglion, but later used four per cent. butyn with adrenalin. The butyn in that strength was not quite so quick and the results not quite so complete in action as the cocaine. In this connection I may mention another case which came under observation. At the time I saw her she had had a hysterectomy eight months ago for cancer and now she had a tumor mass just above the left clavicle about the size of an egg, hard, sore to the touch, and radiating pain down the shoulder, arm and chest. It was found that the pain could be completely blocked off from the left nasal ganglion, leaving only a slight residue of soreness. This was repeated on three several occasions after which she was referred to Dr. Helms of Tampa, who removed the mass and made a diagnosis of sarcoma. These are the only two cases of malignancy in which I have done any nerve blocking.

True Dermoid Cyst of the Anterior Wall of the Rectum*

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On December 4, 1923, Dr. L. A. asked me to see Mrs. I. S., thirty-eight years of age, married seventeen years, who had been delivered of her sixth child, four days before I was called. She was delivered in a sanitarium, and the object of my visit was to determine the advisability or necessity for the removal of the patient to a general hospital for better attention and pathological observation. Her history, copied from a statement given to me at the sanitarium, was as follows:

"Mrs. S. was delivered on November 30, 1923. While the child's head was extracted by low forceps, she expelled by rectum a large hair ball with a fatty exudate resembling vernix caseosa. She denied having swallowed any hair so I made a tentative diagnosis of ruptured dermoid cyst. She had complained of gas pains, which we tried to relieve by high colonic irrigations. After the last two irrigations, she had passed blood, which seemed to come from the colon. Temperature, pulse, respiration, and lochia were normal, uterus undergoing involution. Patient was highly hysterical, and I had advised removal to a general hospital, where she could be kept under observation, and the pathological condition ascertained."

Examination of the expelled mass revealed a mass of matted blond hair, the size of a large hen's egg, the hair being very fine, and the strands from six to eight cm. in length, and matted together with a caseous material. The hair was distinctly blond in contradistinction to the dark hair of the patient, ruling out the swallowing of her own hair, which is not uncommon in mental defectives and in psychoneurotics.

Proctoscopic examination revealed a large ulcerated area beginning about two and a half inches above the anal opening on the anterior wall of the rectum, and extending for about two inches transversely involving about one half the circumference of the bowel, and was filled with granulations and clotted blood. Some oozing of fresh blood was also present.

The upper lip of the ruptured cyst was extremely edematous; so much so as to be in direct contact with the posterior wall of the bowel, and interfering with the evacuation or expulsion of fecal matter, which incidentally permitted fermentation with gas production, and abdominal distention, and inter-

*Presented at the annual meeting of the American Proctologic Society, held in New York, June, 1924.

fered with the proper insertion of the irrigating tube for the relief of the accumulated fecal matter and gas. Insertion of the irrigating tube into the rectal canal was made impossible, beyond the location of the ruptured cyst, and when the tube was inserted, entered the cyst cavity, breaking off some of the granulations and caused bleeding, which the doctor reported as coming from the colon.

A diagnosis of a ruptured dermoid cyst of the anterior wall of the rectum was made, and after having passed a rectal tube, with the aid of a proctoscope, beyond the edematous lip of the sac wall, the bowel was thoroughly cleansed of all accumulated gas and fecal matter. Astringent irrigations were then ordered to check the bleeding.

The woman was very pale and anemic, weak, and her resistance low; operative intervention was contraindicated, so I decided to postpone any possible surgical procedures until her condition had so improved as to make her a fairly good operative risk. Three days later, I saw the patient again. The bleeding from her rectum had been checked, her bowels were moving daily with the aid of mild cathartics, and her astringent irrigations were continued twice daily.

To corroborate my diagnosis of a true dermoid cyst of the anterior wall of the rectum, and to eliminate the possibility of its being an ovarian cyst which had worked its way through the anterior wall of the rectum and then ruptured, I advised a thorough gynecological examination, and one week later, December 12th, Dr. Arnold Sturmdorf was called in, who reported, after a complete gynecological examination, that the tubes, ovaries, and adnexa were perfectly normal and that there were no signs of any connection between the pelvic organs and this dermoid cyst.

December 14th, another proctological examination was made, when I found the rectal wall clean, no bleeding, the ruptured sac was much contracted, only a small opening remaining, through which a few strands of fine hair presented themselves, and a few drops of pus were noticed. I removed the strands of hair, and somewhat dilated the opening of the remaining sac to permit better drainage, but decided that although excision of the entire cyst wall would be necessary to get a complete cure, the cystic cavity was so high up that I thought it better to continue for the time being the rectal irrigations, and keep the sac open, since the woman's enfeebled condition would not permit any operative intervention.

December 22d, proctoscopic examination showed a small opening exuding a drop of pus, which opening I enlarged or dilated by insertion of a Kelly clamp and spreading the blades apart.

January 3, 1924, she called to see me at my office, when I advised continuation of the rectal irrigations with a saline solution, and to wait until she had some manifestations that would necessitate operation. I advised against operation for the present, due to the fact that an extensive operation would be necessary. The sac was situated too high up for a perineal resection of the bowel, and the patient was too dangerous a risk for any extensive abdominal work. Besides, she had a family of six children to look after, which she could well attend to in her present condition. I advised her to see me once a week for the purpose of keeping the sac open to permit the pus to drain into the rectal cavity, and by means of irrigations to wash the pus away,—and told her that we would operate only when the sac closed and symptoms of pus absorption took place; that is, when it became absolutely necessary.

January 10th, the patient called to see me. She appeared better, had gained in weight, had better color, and was feeling well and attending to all her household duties, and taking care of her children. The sac opening was very small, and I dilated it. I again advised her of the importance of having herself looked after once a week.

March 13th, two months and two days later, she called to see me, when she gave me a history of having felt very well and thought that she might postpone her visit, and two weeks after she had seen me, temperature and headaches had developed. She called her family doctor, who treated her for the grippe for a week from January 23d to 30th, and on January 30th, she had a sudden high temperature and a chill and severe cramps in the left side. She was taken to the Mt. Sinai Hospital January 30th, and was operated upon February 12th, thirteen days later. She remained in the hospital for three weeks, and was sent home feeling better. She then went to see Dr. Sturmdorf, who referred her back to me.

March 12th, one month after her operation, she called to see me and complained of now having a discharge of pus from the vagina. A vaginal examination showed that an incision had been made in the posterior vaginal fornix, from which there was a pus discharge. Apparently, when taken to the hospital, the true condition was overlooked, and a diagnosis of a pelvic abscess had been made, and an incision into the pouch of Douglas was all that had been made. Examination of the rectum showed a small opening into the cystic sac, but still discharging pus. I again advised her against a radical operation, and she now sees me regularly once a week. I continue the rectal saline irrigations, and continue to keep the cyst cavity from closing. She is in good shape now, has no pains or aches, has greatly improved in color, health and strength, and has gained over thirty pounds in weight.

In looking up the literature I find this to be a rare condition, which is but one of the reasons I have to offer for presenting this case for your consideration.

Arnold Sturmdorf (1) attributes this condition to failure of embryonal occlusion of the neuroenteric canal. There may be simple pilonidal cutaneous (dermoid cysts) or postrectal dermoid pockets communicating with the rectum, or a fistula may lead from the skin to the mucosa of the bowel.

The variety we have here is the postrectal type communicating with an epithelium lined pocket behind the rectum.

A retrorectal dermoid may become infected and rupture into the rectum, discharging pus and debris for months and years. A sinus or opening in the posterior rectal region discharging pus, hair and débris would lead to a diagnosis, but the surgeon rarely sees the case in this condition. He finds an opening leading to a suppurating cavity, or the pa-

tient complains of periodical discharge of pus from the bowel, the source of which may not at the time be apparent, owing to the intermittent closure of the fistulous opening. Simple incision and drainage or cauterization cannot effect a cure. The cavity is lined with epithelial cells presenting an organic secreting tissue curable only by radical extirpation.

C. B. Kelsey cites A. Danzell (2), who reported a case in a woman aged twenty-five years, in whom a lock of brown hair, the size of a finger protruded from the anus occasionally after defecation. In the front well of the rectum about two and a half inches from the anus, a hard tumor could be felt about the size of a small apple. This was extirpated by introducing the whole hand into the rectum, death following some months later from peritonitis. The hair growing from this tumor was twelve to eighteen cm. long, the tumor itself when extirpated measured four and five tenths cm. long, four cm. in breadth, and three and five tenths cm. thick. The microscope revealed the usual cyst wall and its contents.

Perrin (3) gives an account of three cases of these tumors.

Hodges of Boston (4) described the condition under the name of pilonidal sinus, pilus, a hair, and nidus, a nest. This affection is simply a ball of hair and dirt in a sinus between the anus and the tip of the coccyx. The sinus is a deep symmetrical conical dimple of congenital origin, representing imperfect union of the lateral halves of the body, involving the integument alone, in which as life advances, short hairs and particles of dirt accumulate. These by irritation cause a purulent discharge from a fistulous opening of the cavity and when the case comes under observation may be mistaken for a fistula in ano.

Van Duyse (5) reports the history of a case of labor during which a rectal dermoid was expelled. The dermoid contained a cerebral vesicle, a rudimentary eye, a canine tooth, and a piece of bone.

Pennington (6) asserts that there are many hypotheses for the origin of dermoid cystic tumors. The simple variety as explained by the inclusion theory of Verneuil, e. g., during development a portion of the integument is nipped off, and keeps on growing, though ensconced in the neighboring tissues. The complex growths with bone, cartilage, teeth, etc., are accounted for by Roux's blastodermic hypothesis; e. g., the ovum divides into the primary blastoderms, and if for some reason, the normal development of the latter is interfered with, each may give rise to a smaller embryo, an imperfect embryo, or a complex dermoid (teratoma) with portions of brain, mammary gland, intestine, etc.

True rectal dermoids are much less frequent than similar growths located behind the gut. Nearly all of the recorded examples of rectal dermoids have been found in women, and this gives some support to the former suggestion that they arise in the ovary and erode their way into the rectum (Bland-Sutton).

Mummery (7) reports the removal of a dermoid from behind the rectum of a girl of sixteen with black hair, but a lock of bright red hair was found in the cyst.

Clutton (8) removed an oval tumor with a double pedicle, now in the St. Thomas Hospital Museum, London, from the sigmoid flexure of a girl of sixteen. The pedicle was attached to the wall of the sigmoid and the tumor hung loose in the lumen. The tumor is solid, and is covered with skin and hair. During life the hair grew very long and hung out of the patient's anus, where it had to be cut off periodically.

Tuttle (9) emphasizes the necessity of distinguishing true dermoids of the rectum and those which develop in its walls, the rectovaginal septum, and retrorectal space. Those that originate outside of the rectum may break through into it by ulceration or rupture, and protrude in a polypoid manner into the gut, giving the impression of a growth originating within the organ. He reports (10) a case of a girl of ten with a discharge of blood and pus with stool, and during defecation, a matted mass of tufted hair protruded from her anus. Careful examination showed a rent in the wall of the rectum with the ulcerated edges, through which the tumor protruded. This was a case of dermoid cyst which originated outside the rectal wall, and was forced by straining and abdominal pressure.

Port (11) reports a similar case in a girl of sixteen, from whom he removed a tumor apparently originating in the rectum.

Bazel (12) reports the case of a woman who noticed protrusion of hair from the anus during defecation. He removed a tumor the size of an orange attached by a pedicle to the posterior wall of the rectum about two and a half inches above the anus.

Van Duyse (13) reported the case of a woman of thirty-two, who passed spontaneously from her rectum during labor a tumor which proved to be a dermoid cyst containing a rudimentary eye.

From the above reports of cases, we must admit that although true dermoid cysts are rare, we frequently find tumors of this type in the walls of the gut or attached to their outer surface. These walls may be ruptured, especially during labor, and the tumor be brought down within the gut or delivered through the anus.

The etiology is similar to that of dermoid cysts in other parts of the body, nearly always found in the female sex. They are congenital from the number of cases found in young children. They are not discovered until later in life, when the tumor becomes larger, and causes obstruction to the passage of the fetal head, or to a large hard fecal defecation.

I am presenting this case not only for its rarity, but because I want to get your unbiased expression of opinion as to what you would have done in a case of this kind. Have I done the right thing by this patient, and would you advise the radical operation in spite of the risk and danger entailed, taking also into consideration the responsibilities and the family obligations of this woman?

I should be glad to present this patient for examination at my office to those who are interested.

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345 West Eighty-eighth Street.

Peritonsillar Abscess with Complicating Edema of the Glottis*

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Peritonsillar abscess is not an unusual occurrence, in fact is so common that the practitioner as a rule has no hesitancy in treating this condition as part of his routine work. The case I am reporting is just such a one with a complication that had serious possibilities and I wish to place it on record for that reason.

Case.—Mrs. G., aged thirty, was brought to me with a right peritonsillar abscess, by Dr. B. Herschkowitz, who had seen the patient only an hour before, and recognizing the case as one not of the ordinary type, asked my cooperation in treating her. Examination showed the posterior pillar of the right tonsil to be greatly enlarged, boggy and bulging. The anterior pillar and soft palate were reddened and slightly thickened. The tonsil was pushed forward a little. The superficial tissues over the bulging area were infiltrated with a half per cent. novocaine solution. An incision was then made in the posterior pillar, and a large clamp inserted, extending it slightly backward and downward, until I felt myself going into a large cavity, from which there was a gush of white pus, in all about two ounces. A large opening was obtained by withdrawing the clamp in the open position.

The patient was then sent home, given a mouth wash and instructed to irrigate the involved area in order to get rid of the detritus and give free drainage. She was doing well for that day but at night complained of a choking feeling. Dr. Herschkowitz was called in the morning and when he got there the patient had brought up about three ounces of pus and was feeling better. He found that the boggy swelling of the posterior pillar had extended downward somewhat, but the condition seemed satisfactory and the incision was wide open. There had apparently been a collection of pus below, which was discharged through the incision that had been made. About eight hours later the doctor was called again, the patient complaining of difficulty in breathing. This time he saw that the inflammation had extended to the epiglottis, and the patient was brought down to me.

Examination showed that the inflammatory swelling had extended down to the base of the tongue, and from there, across the base of the tongue, and involving the epiglottis, was a sort of cystic edema of the superficial tissues, as if a solution had been injected producing a bleblike formation. The entire epiglottis was involved, and extended to the false cords and arytenoids. The true cords were just glimpsed, but had not yet been involved. The incision that had been made was found patent and leading into a large cavity, with no free pus, just a boggy mass.

With a fine pointed paracentesis knife, I punctured the edematous area, obtaining a clear straw colored fluid. The patient was then given an adrenalin spray and cold packs to the neck. She was watched very carefully during the night, but there were no further complications, and in the morning the edema had disappeared and the patient was feeling well. From then on recovery was uneventful and three weeks later the tonsils were removed under local anesthesia. The only thing of note at this time was the considerable thickening of the posterior pillar which stood out as if in tension. This was not seen when the tonsil was *in situ*.

One wonders, considering the anatomical structure of the pharynx, that more of these complications do not occur than are reported. The pharynx is made up essentially of the large constrictor muscles, which are laid one over the other and loosely invested by a common fascia, and just beyond them we have the great vessels with their loose packing of areolar tissue extending down the neck to the mediastinum. Excellent pathways for infection.

Several interesting complications have been reported. Richards reports a case which started as a peritonsillar abscess and extended down to the second ring of the trachea. The patient ceased breathing necessitating a hurried tracheotomy, and then it was found that the abscess extended down alongside the trachea. Then there are reports of abscesses extending to the mediastinum, and those involving the great vessels, with severe hemorrhages.

The case reported here was apparently an involvement of the palatopharyngeous and superior constrictor muscles, the condition of surrounding edema being similar to the edema surrounding any inflammatory area.

In conclusion, I wish to emphasize the importance

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and danger of inflammation in the tissues surrounding the tonsils, because of the important structures in the immediate vicinity, and the easy pathways by which these inflammations can spread. Therefore peritonsillar inflammation should not be regarded lightly, even though so many of these inflammations run the course of any apparently minor surgical condition.

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306 East Fifteenth Street.

A New Stopcock for Direct Blood Transfusion

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Blood transfusions have become recognized as a valuable and essential therapeutic procedure in a great many conditions and diseases. There are, however, several phases which require further consideration. Particular reference is made to the need of additional information regarding blood types and the nonspecific reactions which follow transfusions and further improvement in technic. A great many posttransfusion reactions are undoubtedly due to technical errors in the performance of this delicate operation. Any one with an extensive blood transfusion experience will be led to conclude that a great many reactions can be entirely avoided, or greatly reduced in severity, as any one of the procedures now popularized become mastered by the operator. At present there are several ways of delivering unaltered blood (blood without the admixture of anticoagulent substances), in a more or less rapid and satisfactory manner. However, these methods are further subject to improved modifications. It is with this idea in mind that we wish to describe a new apparatus, or stopcock, for direct blood transfusion which in our hands has superseded all others.

DESCRIPTION OF APPARATUS

The apparatus consists of a four way stopcock (Fig. 1-a), which is composed of a plug having two oblique bores extending from both ends at an obtuse angle toward the centre with the outlets of the canals upon opposite sides of the plug (Fig. 2). When the plug is in position the outlets of these canals connect directly to the lateral outlets of the stopcock to which is attached the rubber tubing leading to patient and donor (Fig. 3-a). The canals do not connect in the centre of the plug, thus allowing two currents of fluid to pass through the stopcock in opposite directions simultaneously without admixture. In order to reduce the distance through which the stopcock has to be turned in shifting the outlets from left to right, or right to left, grooves are made transversely upon the surface of the plug which extends half the distance between the two openings. The grooves run in the same direction from their respective canals but do not connect (Fig. 2-a). This reduces the turn of the stopcock from a semicircle to a quadrant. While these grooves are not absolutely essential they are advantageous because of this decreased motion. The terminal ends of both canals are ground to fit Record syringes. In order to prevent the separation of the two portions of the stopcock during the manipulation there is placed on the distal end of the plug a washer (Fig. 3-b), which is held in position by a screw nut (Fig. 3-c). The latter is similar in appearance to the proximal end of the plug. The stopcock is mounted upon a metal rod (Fig. 3-d), which is fastened to a large clamp (Fig. 3-e) by means of a setscrew. The setscrew allows the stopcock to be securely fastened in various positions as the physical conditions of the operation may demand.

THE TECHNIC OF BLOOD TRANSFUSION

1. Two beds, stretchers, or operating tables, are arranged parallel and about eight or ten inches apart. Both the patient and donor should lie in recumbent positions, and as near to the edge of the bed as possible. The character of the veins of both, recipient and donor, determine to a great degree their respective positions. They may be placed side by side with their heads in the same direction, or they may be placed in the opposite direction. Careful study of the most available veins should be made before the operation is begun.

2. A board, twenty by ten inches, (Fig. 1-6), covered by a thin rubber sheeting, is placed between the recipient and donor. The board should be adjusted so that easy connections can be obtained by means of the short rubber tubing leads from the stopcock to the veins of donor and patient at the bends of their elbows.

3. The recipient's and donor's arms are sterilized from shoulder to wrist with three per cent. iodine followed by alcohol. Sterile towels and half sheets are placed around all areas coming in contact with the operators, including the hands of the donor and recipient.

4. A small table, draped to receive the sterile instruments and materials, should be available. The essential materials consist of several 18 French rubber catheters which have been cut into pieces six inches long, three or four 20 c. c. Record syringes, sterile saline, two tourniquets, the stopcock, connecting tips, transfusion needles and petrolatum. Instruments for exposing veins may be on hand but are rarely necessary.

5. As the patient is being prepared the operators scrub their hands as for surgical operation. The stopcock of the apparatus is well lubricated with petrolatum before it is assembled. Syringe B is

filled with saline solution. Syringe A contains just enough saline to expel all air. Several extra syringes should be kept on hand in case of emergency.

6. The apparatus is fastened to the board between the patients and the syringes inserted firmly

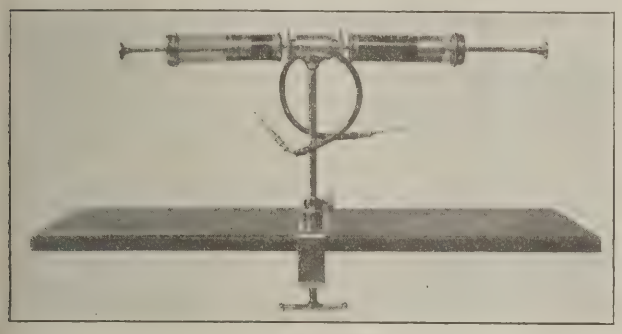

Fig. 1.—Four way stopcock apparatus.

in their respective canals. All air in the tubing is replaced by saline solution. The canals of the apparatus should be so arranged that A connects with the donor and B with the patient. Care should here again be taken to see if the rubber leads reach the position where the needles are to be inserted into the veins (Fig. 4).

7. The tourniquet is applied to the arm of the patient. The needle, gauge 15, is carefully inserted into the recipient's vein and the trocar removed. The point of the needle should protrude for some distance into the lumen of the vein. Connection is now made from the apparatus to the needle and tourniquet is released. Five or ten c.c. of saline is injected by syringe B to determine if complete entry into the canal of the vein has been accomplished. Do not proceed until this connection is entirely satisfactory. The saline solution must enter with slight pressure and there must be no infiltration of the patient's arm. It may be necessary to

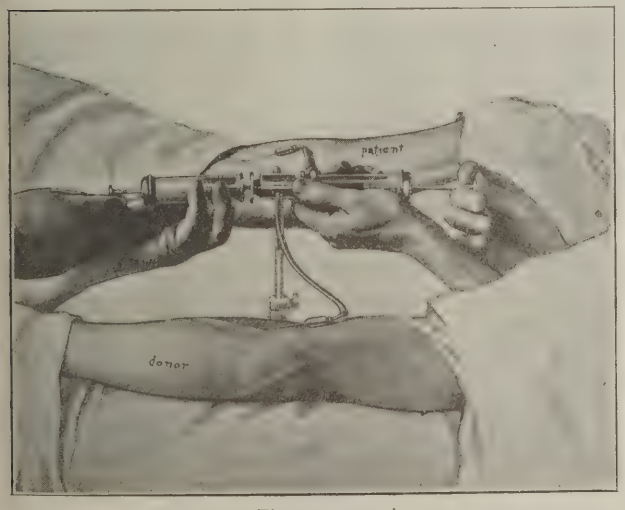

Fig. 4.—The apparatus in use.

maintain some pressure on plunger of syringe B in order to prevent patient's blood from entering connections. The patient is instructed to lie quietly. If saline is forced through the connection to the patient's circulation some time can elapse without interfering with the procedure. This allows the operator considerable time and care to enter the vein of the donor.

8. The tourniquet is tightened upon the arm of the donor and the pulse taken to insure free arterial circulation. Needle, gauge 11, is inserted into a large vein at the bend of elbow of the donor. If practicable the needle had better be inserted downward toward donor's hand, this being the reversed position of the needle in the recipient. It is absolutely essential to get a gush of blood from the donor's vein when the trocar has been removed. The most important requisite for a perfect direct transfusion is an unobstructed forceful flow of blood from the donor. Any interference whatever with this flow interferes with the success of any direct method of transfusion, so that it is most imperative that both the vein of the recipient and the donor are properly entered by needles of sufficient calibre. The tourniquet upon the donor's arm is not released and it may be necessary to have the donor open and close his fist frequently to produce more rapid bleeding.

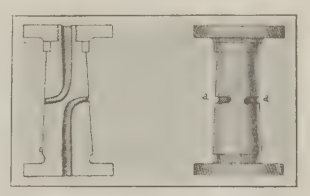

Fig. 2.—Internal bores and mechanism.

9. As soon as the insert of the rubber lead to the stopcock is connected with the needle of the donor the blood rushes into syringe A. While this syringe is filling the remaining saline solution in syringe B is injected into the patient. When syringe A is full of blood syringe B is empty of saline, and the stopcock is turned by the operator of syringe A, by holding the wheel of the stopcock and syringe so that both turn simultaneously. This shifts the canals in a position so that A is in B's position, and B in A's. The blood in syringe A is injected into patient while syringe B is drawing blood from the donor. Pressure toward the apparatus must be applied upon the barrels of the syringes while they are drawing blood, thereby preventing the entrance of air. This alternate drawing and injection of blood by syringes A and B is continued until the desired quantity of blood had been given. Twenty-five syringes containing twenty c.c. each are necessary to deliver five hundred c.c. of blood; fifty syringes full for one thousand c.c. Any amount may thus be easily determined. It is better to have some one assigned for the purpose of keeping accurate count of the number of times each syringe has been filled and emptied. If no assistant is available to use the distal syringe, this canal may be plugged, thus allowing the use of the stopcock by one operator. The distal end of the stopcock may also be used for the simultaneous injection of saline, or immune serum.

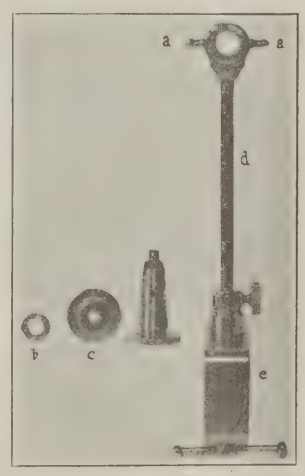

Fig. 3.—Separate parts of the apparatus.

10. When enough blood has been given the donor's tourniquet is released and the needles of both, the patient and donor, are removed. The arms are bandaged firmly to prevent extravasation.

11. The apparatus is carefully cleansed with soap, water and alcohol, making sure that all the canals are entirely free of blood. It is well to apply vaseline to all the parts to prevent tarnishing.

ADVANTAGES

1. Rapid delivery of a large quantity of blood with an uninterrupted stream.
2. Decreased number of reactions.
3. Accurate measurement.
4. Simplicity of construction.
5. Can be manipulated with patient and donor in various positions.
6. Can be used simultaneously for the injection of immune serum or saline solution.
7. Adapted to use by either one or two operators.
8. It is inexpensive and can be readily cleansed and sterilized.

653 Park Avenue.

Venipuncture in Therapy

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Our forefathers in medicine already knew of the great benefits to be derived from bloodletting. The recklessness of its application, however, soon led to its abandonment. It was either because improperly selected cases were treated or because the amounts of blood removed were so excessive that the method fell into disrepute. Nevertheless, in properly selected cases, the withdrawal of moderate amounts of blood at certain intervals is followed by remarkably good results.

The writer has employed venipuncture—removing from seventy-five to two hundred c. c. of blood at intervals of a few weeks to several months—and has obtained such encouraging results in certain cases that it seemed worth while to devise a simple and efficient technic for the carrying out of this procedure.

Originally a single twenty c. c. syringe (Record) was used. The technic consisted simply in disconnecting the syringe from the needle when the former was filled, emptying the blood, washing the syringe, and connecting it to the needle in the vein again; now blood was drawn into the syringe once more. By this time the blood had coagulated in the needle or the latter had slipped out of the vein. It was therefore necessary to start anew, puncture the vein again and repeat the whole procedure. This meant that the patient had to be hurt considerably or the procedure prematurely terminated with consequent failure of the method.

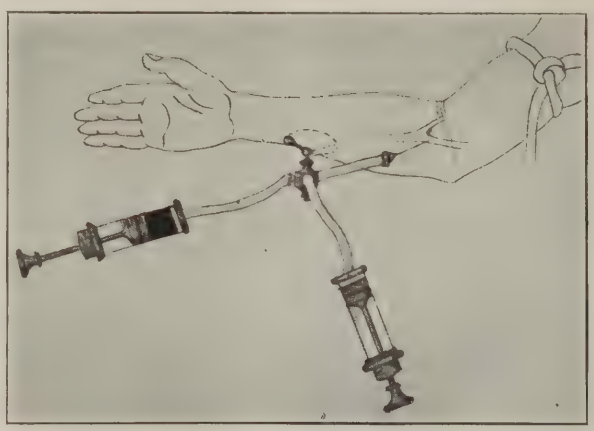

Fig. 1.—Showing connection of syringes in venipuncture.

The scheme which we have finally worked out and which we now use is as follows: Two twenty c. c. Record or Luer syringes are connected by means of rubber tubing with two ends of a three way stopcock. The third end of the latter is connected by a piece of tubing to the needle, the lumen of which must not be too narrow. Now the vein is punctured in the usual way and one syringe is filled. The stopcock is turned so that the other syringe is in series with the needle, and the blood is aspirated into the second syringe. Meanwhile an assistant disconnects the first syringe, empties the blood into a basin of warm water, washes the syringe, and reconnects it. The stopcock is turned back to its original position, so that syringe number one is connected with the needle and blood is again aspirated. Meanwhile syringe number two is emptied of its blood, washed and connected again (Fig. 1).

In this way a fairly large quantity of blood can be removed in a few minutes, i. e., before blood begins to clot in the needle. There is practically no discomfort to the patient except for an occasional slight feeling of giddiness following the removal of blood. To prevent this we have had patients drink a tumbler of water immediately after venipuncture in order to favor the rapid restoration of the blood volume.

We have applied this method to office practice, performing it on a number of patients in the course of an office hour, as well as in the outpatient clinic and the hospital, and have found it generally satisfactory.

The effects of the venipuncture as we carry it out —where 100 to 250 c. c. of blood are removed—are as follows: The patients usually experience a sense of well being soon afterwards; frequently saying that they feel lighter. The blood pressure usually remains unchanged; sometimes there is a slight rise, at other times a fall in systolic pressure.

Patients with cardiac or renal edemas resisting the usual forms of medication, soon lost them if the treatment was preceded by a venipuncture. In the case of edematous patients, the customary administration of water following venipuncture is omitted.

The conditions treated by venipuncture were varied. Cases of cardiac decompensation, especially those with attacks of nocturnal dyspnea (cardiac asthma or Cheyne-Stokes attacks) have reacted miraculously. Congested livers which had previously resisted therapy now would recede quite promptly and the general circulatory condition would improve. Diuresis was frequently stimulated and transudates were quickly resorbed.

Arteriosclerotics, especially the pale and cachectic ones, have bloomed up under this treatment. They became more cheerful and their complexions improved. It seemed as though the bone marrow was stimulated to the formation of new blood. The blood pressure was not usually lowered, in some cases it even rose. The headaches, dizziness and the hot flashes common to women at the menopause frequently lessened. It must be emphasized that we have not restricted this procedure to hypertensive arteriosclerotics. The object in mind was not the reduction in blood pressure.

In a few cases of angina pectoris the patients seemed to do well after repeated venipunctures. In one case of arteriosclerotic auricular fibrillation, the fibrillation stopped and the patient has done very well under the usual treatment ever since the withdrawal of blood from the vein.

It is probable that the improvement in arteriosclerosis occurs because a certain amount of an unknown toxin is removed from the bloodstream and the rest is diluted by the compensatory hydremia following the removal of blood. That arteriosclerosis may originate from some toxin circulating in the blood stream needs no argument. One need only recall the attractive theory of Huchard (1) in this connection. This clinical master considered arteriosclerosis as an intoxication from start to finish.

Another factor which may account for the improvement in this condition is the fall in blood viscosity. This amounts to seventeen per cent. after moderate bloodletting—according to Burwinkel (2) of Nauheim. Because of this, a thinner blood may trickle through narrowed vessels.

Patients with chronic nephritis, especially those with suburemic symptoms, have shown improvement when treated in this way. Their weakness, pallor, anorexia and nausea were oftentimes strikingly benefited. Now thorough digitalization of the heart would be successful in averting an impending uremia. I have observed such an instance in a woman who had had a suppression of urine for four days and who was tided over in this way, but she eventually died in her last uremic attack six months later.

Two stubborn cases of urticaria have reacted beautifully after withdrawal of sixty c. c. of blood. The effect was immediate. On the day following, in order to enhance the therapeutic effect, the serum was reinjected into the veins. This reinjection of autoserum is the mildest form of protein therapy.

Chlorotics and patients suffering from secondary anemias have reacted satisfactorily after repeated venipunctures.

Finally we should like to mention eclampsia. This condition has responded to treatment by venipuncture followed by glucose infusions. These were easily carried out with our method. Our own experience has been limited to cases of postpartum eclampsia. Here medical consultation was requested because the condition seemed grave even after the uterus was emptied.

This is a brief summary of our experiences with the class of cases treated by venipuncture. They are rather encouraging and we believe the method is worthy of more general application.

It may be worth while to quote before concluding Hufeland (3) who said: "It seems probable that the reason for the striking increase in the incidence of cardiovascular diseases in the past twenty years lies chiefly in the neglect of therapeutic bloodletting during this time." This suggests the idea that venipuncture performed in cases of mild or incipient arteriosclerotic disease might be used prophylactically to prevent the more serious forms of vascular heart or kidney disease.

SUMMARY.

A simple efficient method of bloodletting is described. It is hardly unpleasant to the patient. Quantities of blood varying from fifty to a few hundred cubic centimetres are removed at intervals of a few weeks or months. Good results have been obtained in arteriosclerosis, chronic nephritis, cardiac decompensation especially when associated with cardiac asthma, chlorosis and secondary anemia, urticaria and eclampsia.

The author's references will appear in his reprints.

Ectopia of the Urinary Bladder in an Infant

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Exstrophy or ectopia of the urinary bladder is a rare congenital malformation. This distressing deformity is the result of an incomplete closure of the ventral body wall and a failure of the normal formation of the urogenital system.

At the dawn of embryonal development, after the three primary germ layers have formed, the lateral parts of the mesoderm split transversely into two equal layers; the outer one unites with the ectoderm to form the somatopleure, and the inner unites with the endoderm to form the splanchnopleure. The body then begins to assume some shape and form and from the flat embryonal structures which lie in the embryonal area an infolding begins at the periphery to form the framework. This infolding continues until there are formed two tubes, one within the other. The inner tube, made up of the splanchnopleure, gives rise to the alimentary canal while the outer tube which is made up of the somatopleure forms the body wall. Union of the outer embryonal tube

which makes up the body frame takes place along the median line on its ventral surface. The wall of the body cavity is thus joined or seamed together along the median line of the thorax and abdomen.

This line of junction of the abdominal wall is structurally of less resistance than the rest of the body and is therefore occasionally marked by umbilical and epigastric hernias or by a diastasis of the recti muscles. Imperfect development of the body wall or a failure of the proper closure of the body cavities may occur at the line of junction and give rise to slits and clefts of various degrees. A cleft in the maxillary region causes harelip and cleft palate. A fissure may occur along the sternum and divide the thorax in two equal parts. A cleft in the cardiac region may cause an ectopia cordis or give rise to a pulmonary hernia. A slit in the lower abdomen may occur and expose the abdominal or pelvic viscera. In most cases of abdominal clefts, the process extends to the organs lying behind the wall. A cleft in the hypogastric region usually involves the bladder, urethra and the pelvic girdle, so that the posterior wall of the bladder protrudes through the abdominal slit and the urethra is open on its dorsal surface, exposing the grooved floor.

In some cases it is possible that the opening in the abdomen is secondary to a cleft in the bladder, thus providing an easy external outlet for the urinary flow. The edges of the bladder are then fused with the opening in the abdominal wall, making the skin continuous with the inner lining of the bladder. It is, however, always difficult to tell whether the primary malformation is in the bladder or in the abdominal wall as in the case reported below.

Fig. 1.—Ectopia of the bladder, epispadias, bilateral inguinal hernia, in a baby five months old.

Case—P. B., a boy five months of age. Pregnancy, birth and later general development were normal. He was the second child of young, healthy, Polish parents. The first child was well in every way. There was no history of chronic disease or malformation in either family. No consanguinity in the parents. The child was born with a cleft in the lower abdominal region through which the posterior wall of the bladder protuded and the kidneys emptied themselves.

On examination there was seen a square, red, corrugated, fleshy mass which occupied the space between the umbilicus and the symphysis pubis, as shown in Fig. 1. It was three by four cm. in diameter and extended well above the surface of the abdomen. From the lower part of the dislocated bladder the urine welled up, keeping the parts moist and excoriated. The penis, except for the glans, was rudimentary and presented a condition of complete epispadias. There was a bilateral inguinal hernia. The testicles were in the normal position. The rest of the physical examination showed a healthy, well developed child.

DIAGNOSIS

The diagnosis of exstrophy of the bladder is comparatively simple. It mostly occurs in male children without regard to race or age of the parents. The abdominal cleft with the protuding red mass which is constantly moist, the epispadias or the cleft in the clitoris and labia, all point to the proper diagnosis. As a result of intraabdominal pressure and the cut in the anterior wall of the bladder, the exposed organ is everted and protudes above the surface of the abdominal wall. The condition predisposes the child to infection of the urinary and intestinal tracts. Many die in infancy, some live to childhood, but few reach adult life.

Complete absence of the bladder, or a reduplication of the bladder or a partition of the bladder may occur. Some of these malformations are difficult of diagnosis and incompatible with life.

TREATMENT

The treatment is mainly surgical. It consists in a plastic operation of the bladder and the abdominal wall. The bladder is either repaired or reconstructed and the slit in the abdomen is covered with healthy flaps. The ureters may be transplanted in the rectum, making that part of the gut serve both as a bladder and as an intestine.

Medically there is nothing to be done except to keep the part clean in order to prevent infection of the bladder and the kidneys, and to keep the skin from excoriation.

The prognosis is poor. In most cases the condition is beyond operative repair. The child usually exists for a shorter or longer time until some intercurrent disease relieves it of its troubles.

213 East Broadway.

Intravenous Bismuth Treatment.—Fritz Mras (*Wiener klinische Wochenschrift,* July 17, 1924) found that the intravenous injection of bismuth in the form of sodium tribismuthyltartrate, giving ten c.c. of a 0.5 per cent. solution three times weekly gives results equally as good as those obtained with the larger doses given intramuscularly and that these injections are well tolerated. The considerably less frequent occurrence and diminished intensity of the disturbances of sedimentation are noteworthy. The results obtained in twenty-three patients are very encouraging, but a final opinion cannot be given.

Practical Therapeutics

RESISTANCE OR TOLERANCE OF THE GONOCOCCUS TO GERMICIDES IN RELATION TO ANTIGONORRHEAL THERAPY

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Since the publication of the article on The Resistance or Fastness of the Gonococcus to Germicides (1), in which the contention was advanced that this organism possesses an inherent ability to set up a defense against the solutions employed to destroy it, so that the effect of these germicides might be either greatly inhibited or else rendered practically useless, added experience and extended clinical observation seem to indicate that the point was well taken. In the meantime, Young and Miss Hill, at the Brady Clinic, note that, in laboratory experiments, the colon bacillus becomes unduly resistant to mercurochrome when it is continuously subjected to dilute solutions of that preparation. (2) Von Lackum and Hager of the Mayo Clinic advocate the alternate use of mercurochrome with the silver derivatives in the treatment of acute gonorrhea on the ground that the gonococcus becomes recalcitrant to the germicidal authority of either one when constantly employed for any great length of time. (3) Roblee draws a more hopeful picture of the future management of gonorrhea and styles, as specific, the treatment based on the recognition of this phenomenon of germicidal resistance (4).

The process of reasoning which led up to the original communication on this subject was as follows: primary gonorrhea, within the male urethra during the early initial stage, is a very simple disease. It is, then, a superficial, localized, readily accessible implantation upon the mucous membrane of the outer urethra. There is nothing complex about it, and it seems that a germicide applied to this superficial, inextensive inflammatory area, in a concentration known to be quickly lethal to the gonococcus, should have an absolutely paralyzing effect upon that pathogerm. But no chemical has been introduced which will uniformly abort gonorrhea, nor has any yet been found which will produce a systematically satisfactory result in the early acute course of the disease after the period for the abortive treatment has passed.

When using one particular germicide in a series of cases, the following variations are likely to be noticed: in some of the infections, the discharge and acute symptoms are combated like magic, while, in the remaining cases, there is either no improvement at all, or else the inflammatory condition becomes more intensely aggravated for the time being. It is also by no means unusual to observe that an infection, which responded beautifully to treatment at first, in the course of a few days, will break out of therapeutic bounds and take on an apparently unwarranted activity which is startling both as to virulence of symptoms and rapidity of extension.

There must be some scientific explanation of this therapeutic incompetency and variability on the part of remedial agents employed locally against the gonococcus. The profession has found that it is absolutely unable to prevent many of these infections, which are simple in the beginning, from becoming complex and deep seated and which, together with unfortunate sequelæ and secondary manifestations, exhibit an indefinite persistence. The only explanation which fits the facts in the case is that this puzzling occurrence is due to an immunity or resistance which the gonococcus is able to build up against the chemical enemies which seek its destruction. The profession has long recognized the fact that the malarial parasite becomes immune to the effects of quinine, and I am certain that the physician must eventually accredit the same phenomenon to the gonococcus. Personally, I feel that all pyogenic organisms possess the same characteristic and that, in the course of time, the treatment of all pathology induced by them, which calls for the local application of germicides, will be based on a general recognition of this theory.

Reasoning upon the supposition that the gonococcus may become immune or resistant to the bactericidal effect of a chemical which is being resorted to continuously and at short intervals to kill it, it is comparatively easy to account for that type of infection which responds to treatment at first, but which, later on, fails to do so. Here we find a clear instance of an acquired immunity to the drug

But what of the infections which do not evidence an initial response to the same chemical which produced results from the very beginning of the treatment of the other infections? Are these instances of special strain resistance, or of a natural immunity, or are they the result of an acquired immunity which was developed in the infecting host before transmission took place? It might be possible that certain of the twelve or more different strains of the gonococcus possess a resistant idiosyncrasy to an individual chemical, but this is a wide hypothesis to substantiate when we reflect upon the seeming ease with which the organism appears to take on or throw off this fastness in any or all infections. Without question, an infection may not be amenable to mercurochrome in the beginning but may later on react beautifully to that preparation. There is no logical reason to assume that an individual strain resistance would change in this manner.

However, it is highly probable that all of the different strains of the gonococcus, in time, will build up a slowly developed, somewhat persistent and general degree of tolerance to a germicide which is being employed very widely. As an example, the Valentine irrigation method, with dilute solutions of potassium permanganate, does not seem to be as universally effective as it was reputed to be when first introduced. But such tolerance appears to be the result of widespread chemical association or environment, rather than an inherent strain quality. It is relative and not absolute immunity. An infection may not respond rapidly to the Valentine system; but persistence in the treatment will eventually have

a debilitating influence upon the causative pathogerm and force it to capitulate in the end. In an absolute or natural immunity there never would be a response to treatment.

If we concede to the gonococcus the attribute of acquiring a germicidal immunity in one instance, we may with equal propriety grant it in other instances. It does not matter where, at what time, or in what manner this tolerance is acquired. If it can be acquired in one patient, it can be developed in another patient. Therefore, it requires neither a greater stretch of the imagination nor a more perfect digestion of actual facts to comprehend that a resistance may exist at the time an infection is transmitted from one individual to another as well as that it may develop in a given individual during the treatment of an infection which did not seem to possess it at first. The theory is either right *in toto* or else it is wholly wrong and untenable.

In the light shed by prolonged observation of the results of treatment of these infections, the solution of the enigma would seem to be that, since with the passage of time the organism builds up or loses a tolerance to germicides, the immunity is unquestionably acquired; that it is the result of chemical association or environment, and that it is but temporary. It seems to divide itself into two fairly distinct types: a sluggish type and a sudden type.

The sluggish type is slow in developing and is not characterized by an open and wanton disregard of bactericidal authority but by a sullen, rebellious indifference to it. For an instance, let us again refer to the Valentine irrigation method. For the past fifteen years this form of treatment has been more universally employed, perhaps, than any other. During this time, it seems that its potency has been slowly declining until now its effect in early Neisserian urethritis is often slow and gradual. Quite different from the result reported by Valentine wherein he secured a cure in fourteen days in the majority of cases (5). It is true that now and then we are able to get a brilliant result like this with our own cases today but this is not the rule. It is probable that, in those cases wherein we do obtain a showy result, the organisms causing the infection have not been recently subjected to potassium permanganate solutions and, for this reason, have acquired no resistance to that chemical.

We may refer to Keyes for an example of the sudden type (6). He remarks that an infection may react very readily to protargol for eight or ten days and then flare up into sharp acuteness. The infection is then flagrantly and violently in rebellion against protargol. If, however, the treatment is discontinued for a few days, the protargol solution may again adequately control the disease. This is undoubtedly an instance of quick, sudden but fugacious tolerance.

What effect does the recognition of this theory of germicidal adaptability, on the part of the gonococcus, have on the treatment of the disease? In the first place, it adds a thousand fold to the force of the modern urological teaching that each case must be regarded as an individual problem. The management of gonorrheal cases, *en masse*, according to a fixed and undeviating therapeutic system or standard would seem to be a questionable procedure, since it might prove to be an obvious and criminal waste of precious time to treat some infections in a manner which might be vastly inferior to some other method. It entails a more versatile attack against the gonococcus; compels a more thorough understanding of the action of the chemicals being employed and necessitates a sharp, rigid and consistent observation of their effect upon the disease.

At one time it was thought best not to attempt to check quickly the copious discharge from an acute gonorrheal urethra by the local application of chemicals, because their effect would tend to encourage a heightening of the inflammatory reaction and aggravate the existing urethral distress. If the local use of germicides did do this, then the attitude of the profession was right. I suspect, however, that the solutions then in vogue were too greatly concentrated or else lacked the present pharmaceutical range and refinement, because it has been found that germicides judiciously employed, in proper solution strength, will have the reverse effect, in that they will not only check the filthy, annoying discharge, but will allay the acute symptoms in a truly remarkable manner and shorten the course of the disease. The present trend of acute antigonorrheal therapy goes even further than this. If the effect of the germicide or germicides is not immediate or pronounced, the treatment is failing in purpose and recourse to a chemical which will induce a more ready response is in order.

The objective of modern antigonorrheal therapy is to localize the infection to the most restricted area possible and to kill it without undue loss of time. It is poor therapeutic policy to permit an infection to penetrate into the deeper urethral structures or to spread to its adnexal contiguities, if it can be avoided. It is equally poor policy to injure or devitalize the urethra, to its pathological undoing, by the injudicious use of strong chemicals. The sequelæ of ill advised urethral medication may be far worse, for the patient, than the disease itself. We should fully appreciate the fact that, while there are many obvious scientific reasons why we should seek to eradicate a gonorrhea quickly, there are also certain limitations to treatment beyond which we should never go. These limits seem to be the too frequent use of any germicide—all of which are more or less irritating—the injection of devitalizing preparations or the employment of solution strengths greater than the urethra will safely bear.

Any germicide which would uniformly prevent infection spread and rapidly kill the gonococcus without injuring or devitalizing the urethral tissue could be defined as an ideal gonococcicide. The alert practitioner recognizes the limitations of his therapeutic armamentarium in that, as yet, there is no ideal gonococcicide; but there are a number of preparations at his disposal which have a very decided lethal influence upon the gonococcus and, if he profits by a careful observation of the effects of local treatment with these, he will be enabled to select from the list one or more which will prove so antagonistic to the gonococcus that the average results will be quite gratifying.

The important point to remember is that all infec-

tions do not respond alike to a given gonococcicide in the beginning, nor is the action of any one uniform, invariable or consistent throughout the course of the disease, even though the infection may have been severely disciplined by it at first. Basing the treatment regimen upon these facts, the average length of time it requires to subdue a gonorrhea is materially lowered and, it is safe to say, the danger of complications and sequelæ is lessened.

What rules shall govern our conduct in the selection of a gonococcicide? This is a difficult question to answer because experience counts more heavily here than the assimilation of an abstract dissertation. I am tempted to approach the subject by dividing all cases into two classes: those which have received treatment before admission and those which have not.

In the former class, a careful case history will elicit information concerning the method and extent of treatment already undergone, together with the type of germicides used. Knowing this, it is advisable, since previous treatment did not produce results, to shift to some germicide not already called upon. Suppose, for example, the infection has been treated for some weeks with argyrol solutions. In this time, it has probably become rather extensive, while at the same time the causative organisms have become toughened by exposure to the silver derivative. If the infection is in an acute, frank stage, it is useless to consider argyrol further. The dye germicides or permanganate irrigations will serve a better purpose. If, however, the infection shows that argyrol has been having an inhibiting influence upon the inflammation and that it is in the declining stage, it is not advisable to discontinue argyrol altogether. Supplementary medication with some of the dye germicides or permanganate solutions will then bolster up and augment the effect of the argyrol. Alternation between a silver derivative and mercurochrome may not be good. Observation of the case will quickly determine this and then, if the results are not favorable, alternation with acriflavine, metaphen or mercurophen may be effective. In this class, the posterior urethra is almost invariably involved.

The situation presents a different aspect in the latter class. These infections, for the most part, are confined to the anterior urethra. The object of treatment is to select a method which will do two things: first, that which offers a minimum of mechanical assistance to the spread of the disease and, second, that which proves most antagonistic to the gonococcus in the majority of cases.

Under the first consideration, irrigations would seem to be contraindicated since there appears to be a greater percentage of posterior urethritis associated with this form of treatment than if gentle injection of small amounts of fluid is made into the anterior urethra with some type of hand syringe. This restriction rules out the most efficacious way of using potassium permanganate. If, however, the infection has traveled into the posterior urethra, there is no contraindication to irrigations.

It seems that the dye germicides, as a whole, will control an acute discharge more quickly and uniformly than any other class of gonococcicides. They have one great drawback. Their action is rather fugacious and, if they are employed at the frequent intervals necessary to control the disease, they often prove quite irritating; seem to cause an induration of the urethra and, by their pronounced diffusible and penetrative faculty, they seem to impregnate the urethral wall with the dye to such an extent that it is temporarily devitalized. These limitations should be constantly carried in mind or these powerful dye germicides may be quite harshly and unfairly condemned, when the fault really lies with the method of application. I find mercurochrome extremely valuable; but I do not rely upon it alone for two reasons: first, when used often enough to be curative in itself it taxes the urethra too much in the manner mentioned above and; second, the gonococcus becomes resistant to it, in many instances, before it will produce a cure. For these reasons, I alternate it with one of the silver derivatives. Should the urethra evidence either a deleterious or an irresponsive reaction to mercurochrome, alternation of the silver derivative with acriflavine or permanganate irrigations generally suffices to control the infection nicely.

While these dyes are unquestionably valuable in the treatment of gonorrhea, their effect must be carefully observed and they should be promptly discontinued if the urethra shows signs of chemical distress. They should be alternated with some other compatible gonococcicide so that it is not necessary to inject them so frequently. A urethra may tolerate a one per cent. solution of mercurochrome once a day very well for several weeks, while two or three injections daily may set up a severe reaction. Alternate gonorrheal therapy has an added value in that the gonococcus does not become resistant to two or more germicides as quickly as it will to a single one for the simple reason that it is not being subjected to the influence of any one of them as frequently.

In the strenuous and commendable search for gonococcicides which more nearly approximate the ideal, we must not lose sight of the fact that there are other factors, than the local application of germicides, to be considered in the treatment of gonorrhea. The regrettable tendency on the part of the gonococcus to migrate into the urethral adnexa is responsible for a more or less constant percentage of prostatitis and seminal vesiculitis. No solution, however diffusible and penetrating, will carry through to the vesicles. It is foolish to expect the impossible from a drug, and we should not look for a cure of the urethritis when an active contributing focus of infection exists within the adnexa, which is untouched by the medication. We may hold the urethritis in abeyance until the focus is eradicated, but we cannot cure it until that is done. Failure to detect complications may incline us to condemn unjustly the remedial properties of gonococcicides in many instances.

It has been the experience in this office that the procedure adopted by the German medical staff during the Great War, when followed here, has been responsible for a decided reduction in infection time in those cases in which the adnexa have been involved. The Germans instituted routine massage of the prostate gland and seminal vesicles during the second week of a posterior urethritis (7). By so doing, they found that sequelæ were more cer-

tainly insured against, complications minimized and infections shortened.

It is an obvious essential to rational treatment to eliminate contributing foci within the urethral adnexa. But here is a very important point to remember. An infected seminal vesicle may undoubtedly reinfect the urethra. On the other hand, a recrudescence of the infection within the posterior urethra may reinfect the seminal vesicle. For this reason we should not simply mark time with the urethral treatment while the prostatic or vesicular inflammation is subsiding. We should rather direct our efforts toward a coincidental and synchronous cure of each. Therefore, we see that the close observation of the effect of germicides within the urethra should never grow lax. A more constant and purposeful watch upon our gonorrheal cases will certainly prove worth while. Like safety upon the sea, which is obtained only at the price of eternal vigilance, the secret of success in the treatment of gonorrhea rests upon the same principle.

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Sodium Salicylate Injections in Epidemic Encephalitis.—Courcoux and Meignant (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* May 8, 1924) report a case confirming the favorable results previously recorded in epidemic encephalitis by Carnot and Blamoutier, Rathery and Gournay from intravenous injections of sodium salicylate. In the authors' case, after nine days of ordinary treatment, without improvement, four grams of sodium salicylate in a four per cent. solution were injected intravenously on each of six successive days. Improvement was manifest by the second day, the somnolence disappearing, the patient sitting up in bed, the myoclonic movements practically ceasing, the urine output slightly increasing, the temperature gradually subsiding to normal, and the appetite later returning. Intravenous administration then becoming impossible on account of the small size of the patient's veins, treatment was irregular, partly by the mouth and partly by the intramuscular route and subarachnoid space for a few days, during which the symptoms grew worse again. Beginning eight days after cessation of the intravenous treatment, four grams of four per cent. sodium salicylate were injected daily into the muscles of the thigh for twelve days, then on alternate days. Improvement was soon apparent and continued progressively, the patient later requesting to be allowed to get up and eat. This improvement was slower than that which had followed the intravenous treatment. Nevertheless, the time relationship of the improvement and treatment seemed to show that the salicylate was active even when given intramuscularly, and this route therefore seems advisable where, for any reason, the intravenous route, which is the best, is unavailable.

Pressure Treatment of Varicose Ulcer.—G. Nobl (*Wiener klinische Wochenschrift,* June 26, 1924) asserts that the bacterial contamination of the varicose ulcer has no bearing on the course and the healing of the ulcer. The only etiological treatment is the relief of the stasis and congestion by pressure bandages, of which the dressings with rubber sponges and zinc gelatin are the best. In addition it is advisable to produce an artificial thrombosis of the veins with five per cent. carbolic acid and ten per cent. sodium carbonate solutions.

Treatment of Hemorrhoids by Submucous Injections of Chemicals.—H. Graeme Anderson (*British Medical Journal,* July 19, 1924) experimented with various chemicals, such as carbolic acid, quinine and urea, iron perchloride, ergot, lead acetate, alcohol, and formalin. He maintains that carbolic acid is the best of all, though quinine and urea give almost as good results. For the past few years he has confined himself to the use of carbolic acid and he believes that ten per cent. carbolic acid in equal parts of glycerin and distilled water is the best solution to use. With this solution, injected at the proper site, the best and safest results are obtained, and no complications such as pain, hemorrhage, sloughing, ulceration, and abscess formation should occur.

Intraarticular Injections of Sodium Iodide, a New Method of Treating Late Syphilitic Joint Affections.—Hermann Schlesinger (*Wiener klinische Wochenschrift,* June 26, 1924) says he has had good results with the intraarticular injections of between 0.2 c.c. and 1.0 c.c. of a ten per cent. solution of sodium iodide in the late joint conditions after other treatment has proved futile. This treatment is associated with little pain and the improvement is seen soon, sometimes even after one hour.

Local Anesthesia in Cystoscopy.—L. D. Keyser (*Virginia Medical Monthly,* October, 1924), after emptying the bladder completely of residual urine with a soft rubber catheter, introduces one ounce of a freshly prepared ten per cent. solution of novocaine into the bladder through the catheter. As the latter is being withdrawn, a further amount of the same solution is injected along the posterior and anterior urethra; for this purpose about one-fourth ounce of the solution is required. A small pledget of cotton impregnated with ten per cent. cocaine solution is then placed in the fossa navicularis to anesthetize the meatal region. Thus the mucous membranes of the trigone, sphincter and entire urethra are definitely exposed to a strong anesthetic solution. Ten to fifteen minutes are allowed to elapse before introduction of the cystoscope. In a series of twenty-five cases the anesthesia was almost perfect in all but two, in one of which the solution had been merely injected through the anterior urethra, probably not reaching the trigone or sphincter—the points subject to most irritation in cystoscopy. No spasm of the ureteral meatuses was encountered in the series.

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The Natural History of Hyperthyroidism and Its Significance

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A simple hypertrophy of the thyroid is the most common kind of goitre. If this is accompanied by the symptoms of fatigue, that is, by mental and physical asthenia, with pallor and evidences of gastrointestinal inactivity, and thyroid feeding then affords relief, the condition is called one of hypothyroidism. The extremes of muscular fatigue, by the way, are accompanied by a fine or coarse tremor or socalled nervousness, and this is just as common in hypothyroidism as in hyperthyroidism.

INFLUENCE OF ENVIRONMENT

The exact cause of the hypothyroidism and the mechanism by which it is brought about are unknown. But, in adults at least, the most prominent symptoms, or those of fatigue, point first towards the environment. Worry, hard work and too little sleep are such commonplace attendants upon everyday life, and so often followed by other neuroses, especially of the gastrointestinal tract, that their relationship to the biochemistry of the thyroid is difficult to prove. It is only possible to surmise the cause and its effect by the sequence of events. An adverse environment requires a greater expenditure of energy than one which is favorable for the individual under consideration. After a simple hypertrophy, or goitre, becomes perceptible, it always increases in size and vascularity when the environment is adverse. When it is favorable the goitre shrinks. Exactly the same changes usually take place during the course of acute or chronic infections or immediately after traumatism. All of these circumstances require in the bodily resistance more or less expenditure of energy, and as it increases so does the goitre and its vascularity. That is, the goitre, after it appears, evidently enlarges in direct proportion to the activity of the bodily metabolism, which means energy expenditure, and hence, because of the known relationship of the thyroid to metabolism and to the general process of oxidation, it is reasonable to believe that the function of the thyroid is, through its secretion, to promote the production of cellular energy.

A socalled nervous person is only one who reacts to environment with more than the usual energy. Why men of this type are commonly afflicted with pylorospasm or gastric ulcer, while the corresponding kind of women often suffer from goitre is unknown. But, clinically, this seems to be the rule. Because the goitre, after it becomes perceptible, evidently enlarges under conditions which require energy expenditure and shrinks when they are eliminated, it is presumable that the simple hypertrophy begins as an automatic attempt at compensation. The gland enlarges in response to some mechanism which calls for more secretion than can be supplied by the thyroid of normal size. If the ingested iodine is insufficient to make the requisite amount of secretion, there should be the same response, and this has been made reasonably certain in animals by the observations of the agricultural department. But feeding iodine to man is believed to prevent only a moderate proportion of the cases, and after the development of the simple hypertrophy it cures still fewer. That is, there are other factors in the pathological physiology to be considered. As yet, we can only surmise these in the environment and in the acute and chronic infections and in traumatisms, which all seem to be related to the thyroid through its promotion of the production of cellular energy.

The most common response in the thyroid to an assumed overstrain of this character is the simple hypertrophy of the gland, and the next most common of this organ's abnormalities is the condition known as that of hypothyroidism. It is given this name chiefly because of the relief of the subjective symptoms which follows thyroid feeding. If this feeding is pushed to an extreme, it is easily possible to change the preexisting quiet to a rapid pulse, and that, or tachycardia, is the most characteristic evidence of the condition called hyperthyroidism. To make the diagnosis, only the obtuse require the aid of the calorimeter.

PULSE CHANGE

The change from the normal to the fast pulse rate can be induced rapidly or slowly, and is in direct proportion to the amount of the thyroid feeding. The same change can sometimes be brought about in hypothyroidism by the administration of excessive amounts of iodine. More often, however, iodine in hypothyroidism is entirely inert. It seems only to be capable of inducing the disturbance in those cases in which it brings about a preliminary swelling or enlargement of the gland.

It is a matter of common observation to note that the continuation or intensification of an adverse environment in states of exhaustion or pronounced fatigue will speedily produce a tachycardia. When the environment is not strenuous or when rest is obtained the tachycardia disappears. It only becomes pathological or characteristic of hyperthyroidism when the tachycardia persists and there is present a goitre. The same events take place in the presence of an increasing infection or traumatism, or of a psychological disturbance, although the latter is synonymous with an adverse environment. In other words, a hypothyroidism which is recognizable as a fatigue condition with the coexistence of a goitre, can be often observed to change into the less common hyperthyroidism. The rapidity of the change is in proportion to the stress or the presumable demand for the production of energy. Usually it takes place more or less slowly, and the tachycardia is at first apparent only after exertion or excitement. This is sometimes called the mixed hypothyroid and hyperthyroid disorder. With rest and with relief from the infection or traumatism, but always with rest, the hypothyroid state is predominant. With intensification of the strain the tachycardia and the goitre with its vascularity become more prominent, and there may finally be added the striking symptom of exophthalmos. How that is brought about no one knows, but experience proves that it means a much graver prognosis than the simple hyperthyroidism.

ETIOLOGY

Clinically, therefore, it is reasonable to believe that hyperthyroidism is merely a terminal manifestation of a primary failure in the function of the thyroid. It apparently begins with a simple hypertrophy of the gland in an automatic attempt to promote the production of cellular energy. If the organ is inefficient, either because it cannot obtain enough iodine or because it is unable to metabolize an abundance of that element, the resultant condition is the same, or that of hypothyroidism.

This condition of apparent functional failure, in its early or milder stages, is not demonstrable by the calorimeter but only by subjective symptoms. It should occur in the presence of a goitre, which is required to promote the production of more energy than it can sustain, but the resultant symptoms of fatigue can seldom be relieved by the administration of inorganic iodine.

THYROID FEEDING

All of the symptoms, with the exception of the goitre, are quite amenable, however, to the right kind of thyroid feeding, especially if this treatment is combined with rest, which means with relief from the need of energy expenditure. If this relief is not provided, that is if the energy expenditure is continued or intensified even though thyroid feeding is continued, there is sure to follow a more or less constant tachycardia. As remarked before, without altering any other factor, the same change can be induced by excessive thyroid feeding or more rarely by the administration of excessive amounts of inorganic iodine.

There is apparently some indeterminable stage of hypothyroidism, or presumable inefficiency in the thyroid epithelium, when its biochemistry alters, at least in man. Before this stage is reached thyroid feeding relieves, while afterwards it intensifies the symptoms. Tachycardia, as remarked before, is the regular reaction of exertion or excitement upon any ordinary extreme of fatigue, and is characteristic of hyperthyroidism only by its persistence. Ordinarily, the tachycardia in the beginning is not persistent or constant but intermittent. It represents, as in everyday weariness, an irritable rather than a rapid heart rate, but sooner or later if the need for energy expenditure is not relieved, the pulse becomes regularly rapid and this, in conjunction with a goitre, constitute the unmistakable signs of the final stages of what appears to be a failure of the thyroid. There is no doubt that the disease may develop with apparent suddenness, but this suddenness is probably only apparent.

The most common, or regular, course seems to be that outlined above, and should therefore be treated at least with circumspection. These patients seem to have a weak point in the important and complicated chemical mechanism which supports all the bodily activities. Their thyroids do not all have the normal and rather remarkable powers of regeneration which are shown in a few other organs, and the indiscriminate sacrifice of the gland shows enough bad results to make the surgeon cautious. The development of the socalled toxic adenoma, or localized tumor, in an otherwise normal gland which is accompanied or followed by tachycardia, seems to be only an incident in the process outlined above. It may be connected with congestion and a punctuate hemorrhage with irritation of the immediately surrounding tissues.

But however it may originate, the tumor presumably interferes by pressure with the normal functioning of the adjoining cells, and when these fail to fulfill the automatic demands upon them, the hyperthyroid condition may sooner or later supervene. But the "toxic" adenoma is just as frequently accompanied by hypo as by hyper signs, and either condition can be relieved by its excision. The nomenclature should not be allowed to confuse the outline of the story which begins with a simple hypertrophy of the thyroid apparently to compensate for the promotion of more energy production than the gland of normal size can supply. The next stage is that of failure, or hypothyroidism, and the next that of the irritable pulse of extreme fatigue rather than the regularly rapid pulse, and the next that of constant tachycardia or hyperthyroidism. The gland may be overactive, but it apparently represents not an excess of normal vigor, but a failure.

TREATMENT

The best treatment is, of course, the recognition of the natural history of the disease and its prevention in the early stages. Few realize that there are any differences in the medicaments commonly used for thyroid feeding. When administered for hypothyroidism some are much more toxic or much more likely to be followed by tachycardia than others. Probably the least toxic is the thyroid nucleoprotein material. A glycerin extract of the whole gland is somewhat more potent, and now can be obtained in five minim or ten minim pills. The ordinary tablets made by dessication of the entire organ are less reliable.

Etiology and Pathogenesis of Tertiary Syphilis of the Thyroid Gland

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The thyroid gland is not frequently the seat of tertiary syphilitic lesions and few cases have been reported. As to why this gland should be relatively free from luetic processes may perhaps be best explained by Mendel's theory, viz., that the colloid substance secreted by the vesicles contains a certain amount of organic iodine whose antiseptic properties are unquestionable. Now, this iodine is constantly being thrown into the circulation, irritating the thyroid, and it would appear that this is a sufficient reason for preventing the treponema from becoming lodged anywhere along this vascular network. It is difficult to conceive how a gumma, which melts away under the action of iodine, could develop in an organ which is the principal reservoir of organisms of this metalloid.

Nevertheless, gummatous or sclerogummatous tertiary thyroiditis occurs. What are its causative factors? In the first place, the process can only develop in an organism already infected, either congenitally or by acquired infection. Therefore the personal and hereditary antecedents of the patient must be carefully gone into when there is any suspician of syphilis and the modern tests for detecting it carried out.

Now, in an old syphilitic subject, what may be the conditions under which a gummatous or sclerogummatous process develops. Let me say at once that in congenital syphilis we are dealing with a true septicemia from the start. Just as in acute miliary tuberculosis, the gummata are generalized; they are to be found throughout the organism, not merely in the thyroid, but in the liver, suprarenals, lungs, thymus, and other organs. In acquired syphilis a preexisting goitre was for a long time thought to be an important predisposing factor, and Kocher said, "Just as goitrous thyroids are a prey to general infectious processes, which preferably produce a thyroiditis, so syphilis is more prone to develop in preexisting goitre, which decreases the resistance of the thyroid gland." This opinion, sustained by Mendel, Bérard, and Zoeller, seems to me rational, and in twenty-six cases collected by me there is only a single instance of preexisting goitre; therefore it may be supposed that syphilitic strumitis is exceptional.

Tertiary thyroiditis is somewhat more frequent in women and to back up this classic opinion (Bérard) it has been pointed out that the gland has many periods of perturbation, namely, during puberty, menstruation, pregnancy, and the menopause. Of the twenty-six cases referred to, five were in infants whose sex was not stated, eight in men, and thirteen in females. Hence, tertiary syphilis of the thyroid is slightly more frequent in women.

As to the age at which the process develops, it would seem that the youngest subject was a girl of eighteen years (Professor Guyot's case), with congenital syphilis. Of twelve cases of acquired syphilis in which the patient's age is mentioned, the average is forty years, but Küttner has recorded the case of a patient twenty-seven years old, while in the museum of the Royal College of Surgeons, there is a specimen taken from a female sixty years of age. Seven out of the twelve patients varied between thirty-eight and forty years of age.

The influence of cold, trauma, or profession, seems to be quite unimportant, while I find no instance in which a former thyroid infection—specific or otherwise—played any part. Nevertheless it is probable that a secondary syphilitic thyroiditis—which so frequently occurs without being noticed—may have placed the gland in a state of miopragia which by impairing its secretory function, will later on hinder its defensive action against syphilitic infection. We know then little definitely of the intimate causes that induce the treponema to attack the thyroid in the tertiary period, and as Fournier said, "Tertiarism attacks an organ as if by chance, the causes of this localization being unknown." The thyroid gland does not escape this rule.

I shall now make an attempt to explain, not the why and wherefore, but the how of the process by which the treponema becomes localized in the thyroid in the tertiary phase of the infection. This attack appears to take place in three distinct ways, the first being by the circulation, a classical theory. The spirocheta carried in the circulation penetrates the vascular network of the thyroid and comes into contact with the thyroid vesicles. Usually the iodine compounds contained in the gland make it impossible for this organism to remain in it, but if on account of former morbid changes the iodine is not fixed by the gland, the infectious agent will be in a condition to attack the walls of the vessels producing lesions of the adventitia, the intima, or even the three coats of the vessel. A secondary cell infiltration is the consequence of this vascular inflammatory process and will assume the form of a perivascular sleeve. The treponema may also break through the vessel walls, penetrating the connective tissue and thyroid parenchyma. Hübschmann has been able to detect the organism within the cells. The specific organism continues to provoke—during its various peregrinations—an abundant embryonal cell infiltration which gradually will dissociate the glandular elements, giving rise to circumscribed nodules.

According to the evolution of the cell infiltration towards fibrous organization or to necrobiosis, one will be dealing with either sclerous lesions or gummatous processes. If the two are combined they finally end in the sclerogummatous form. However, I would add that the higher histological elements of the gland are relatively respected and the syphilitic changes are more prone to involve connective tissue and bloodvessels.

Such is the classical theory. It does not exclusively explain the gummatous or sclerogummatous lesions of the thyroid, and in my opinion it can only explain the occurrence of lesions due to congenital syphilis, either early or late, as well as certain circumscribed gummatous forms of acquired lues. But in the sclerogummatous and ligniform types, the thy-

roid seems to be attacked by way of contiguity. Quite recently Dr. G. Monod has shown that Riedel's disease or chronic ligniform thyroiditis, usually has a syphilitic basis and is accompanied by important lesions of the trachea which, according to him, are even the starting point of the thyroid process.

According to Dr. J. B. Davies, a tracheal or laryngeal syphiloma may easily provoke an inflammatory reaction in the neighboring tissues which, as Lecène points out, produces a true more or less diffuse cervical cellulitis which gradually surrounds the thyroid, compressing it, and from this compression changes are set up.

It likewise would seem as if this same process is frequently the causal factor of syphilitic sclerogummatous thyroiditis. In ten of my collected cases of this type of lesion, the notes of two are incomplete so that they need not be considered; in a third case autopsy did not reveal any involvement of the trachea, but in the remaining seven, tracheal lesions were present in all, such as crude or ulcerated gummata or cicatricial stenosis, revealed by laryngoscopy or autopsy; and in my judgment these findings are quite sufficient for adopting Lecène's opinion. But if this opinion is accepted, it means that the thyroid is secondarily involved by contiguity or compression. Briefly put, the conclusion infers that all cases of tertiary ligniform or sclerogummatous thyroiditis are uncommon yet possible complications of tracheal syphilis. This problem requires further study. In the two most recently reported cases, those due to Poncet and Lerich and Monod, the histological interpretation is in favor of this hypothesis, the gummatous necrosis being in these cases, as Alamartine points out, inflammatory and not vascular in origin.

Lastly, there remains a third, although quite hypothetical, manner of action of the syphilitic virus, namely, the possible action of the toxins of the spirocheta on the thyroid in the tertiary period. In point of fact, these toxins have so far received little attention from laboratory workers. But there is no valid reason that they do not exist. If the toxin of tuberculosis—which does exist in fact—is capable of producing the inflammatory tuberculoses of Poucet, why should not the toxin secreted by Schaudinn's organism be capable of producing similar effects?

By analogy, let me recall the researches of Roger and Garnier, who demonstrated some years since that injections of attenuated cultures of the tubercle bacillus produced a progressively developing sclerosis which ended by transforming the thyroid gland into a fibrous mass containing only some islands of normal thyroid parenchyma. To my way of thinking, the toxic action should be admitted. Therefore, syphilitic toxins may produce an inflammatory reaction of the connective tissue (sclerosis) of the thyroid gland, with complete atrophy of the gland cells sometimes ending in myxedema, as shown by Pospelow, in 1894.

This observer reported a case of myxedema complicated with diabetes insipidus, which was cured by antisyphilitic treatment, and he believes that a syphilitic sclerosis of the thyroid was the cause of the process. The patient had presented characteristic primary and secondary accidents and, when the myxedema developed, there was a gumma of the testicle. The thyroid was hard and slightly increased in size.

Adenoma of the Thyroid*

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In a previous paper we have given the clinical classification of affections of the thyroid gland, employed in this clinic.

The only condition in which there is a physiological gland is adolescent goitre. In all the other conditions, there is a pathological gland, with varying degrees of increased or diminished secretory activity, or with dysfunction.

There is probably no disease that has brought about as much theorizing and speculation as to etiology on the one hand, and biochemical and physiological changes on the other, as diseases of the thyroid gland. Eliminating theory and speculation, there remain three outstanding facts concerning all conditions of the thyroid gland. These are: 1, Anatomical changes in the gland. This produces a change in size. 2, Functional changes of the gland. This is responsible for the clinical symptomatology. 3. The end results of these two forces. The active agent has ceased to operate, but the irreparable influence on the heart, the liver and the kidneys is left behind.

Goitre of adenoma may be associated with hyperthyroidism; or it may occur without any evidence of thyrotoxicosis. Whatever the clinical symptomotology may be, there is no strict differentiation between the histological pictures. Hypertrophy and hyperplasia cannot be distinguished. Between them there is only a difference of degree of progress of the same exciting cause. The character of the end results remains the same, regardless of what may be the influence that primarily induces the thyroid enlargement.

Changes that constitute simple hypertrophy may be designated, seriatim, as: enlargement of the thyroid; increase in vascularity; a softening in consistency of the gland; a diminution of the iodine and colloid contents; an increase in the size of the acini, with variability in size and outline; and, an increase in the size of the epithelial cells. Should there be a continuance of the exciting mechanism that prompted the hypertrophy, these changes increase in degree, and, in addition, there is added actual

*From the Surgical Service of Professor Charles Gordon Heyd, New York Postgraduate Hospital. Read before the Surgical Conference, New York Postgraduate Hospital, April 10, 1924.

proliferation of the epithelium of the acini; the formation of new acini; and infoldings, in the form of papillary projections, into the lumen of the acini. These changes constitute hyperplasia. Allan Graham states: "It is almost inconceivable that the thyroid can jump from its normal state into a well-marked hyperplasia, without there having been some degree of simple hypertrophy, unless the hyperplasia is a manifestation of malignant new growth."

Marine classifies adenomatous thyroids into two types: Type A.—Diffuse colloid adenomatous goitre; Type B.—Fetal adenoma, subdivided into, 1, pure fetal, 2, intermediate, 3, colloid. These subdivisions refer to the degrees of differentiation of cellular arrangement, ranging from undifferentiated embryonal tissue to the highly specialized arrangement of the normal, fully developed gland.

Two theories present themselves to explain the origin and nature of Type A (i.e., diffuse colloid adenomatous goitre). Probably each contributes its share. The first is that this type is a progressive change of a true fetal adenoma, in which the individual adenomatous buds had been of a very highly differentiated and specialized order. The second suggestion is that diffuse colloid adenomatous goitres originate in old, long standing colloid goitres, in which large amounts of the colloid material had been absorbed. This absorption may be occasioned by the injudicious administration of iodine and thyroid products, or by an increased activity, essentially in the gland. The result is the phenomenon of hyperplasia, notably an increase in the number of acini, and in infolding and projecting of the epithelial cells lining the ascini. In any event, this type possesses certain definite characteristics. It is always present in both lateral lobes; the individual nodules are made up of acini that are rich in colloid, and do not make tumors of any considerable size; the capsule is thin; this goitre practically never undergoes malignant degeneration; the individual masses are never lobulated. Histologically, diffuse colloid adenomatous goitre bears a close resemblance to the normal gland.

The palpatory diagnosis is of a diffuse, soft, symmetrical enlargement of the thyroid. The thrill is not so markedly present as it is in Graves's disease, nor is the auscultatory bruit. If toxic changes take place, there is likely to develop an asymmetrical enlargement of the active lobe; or single or multiple discrete nodules. However, the toxic symptoms may develop without this change in anatomical contour, which makes it resemble type B.

Type B (fetal adenoma) is more definitely a tumor than type A. This type of goitre has its origin in socalled Wölfler's rests, which are remnants of embryonal tissue left over from the developmental period of the thyroid. These embryonal remnants, laid down in intrauterine life, may be present in one or both lobes, either singularly or in number. The size of the nodules so formed is variable, and the histological appearance depends on the developmental stage of the individual nodule. Hence, in the same gland there may be clumps of opaque, grayish, undifferentiated, embryonal tissue, having no colloid material and no acinar arrangement of the epithelial cells; together with fully developed fetal adenomata, in which there is much colloid and iodine and in which the acinar arrangement resembles the normal thyroid gland. The degree of differentiation is responsible for the subdivision of fetal adenoma into pure fetal, intermediate and colloid groups.

The palpatory diagnosis depends upon the gradation of the process. There may be an enlargement of an entire lobe of the thyroid, or merely a firm discreet mass, in a lobe. Again, there may be multiple, smaller nodules, disseminated throughout the entire gland, giving the thyroid a pebbly feel. It lacks the homogeneous enlargement of Graves's disease.

Although adenoma of the thyroid may occur at any age, it most frequently makes its appearance in the early twenties. The potentiality for the development of the fetal adenoma is congenital, for the Wölfler's rests are laid down during intrauterine life. Once having made its appearance, the course of thyroid adenoma varies. Whereas in some there is an apparent arrest of the process, the only evidence of its existence being its actual presence, in others it will enlarge, producing pressure symptoms, or take on toxic changes. Malignancy of the thyroid almost never occurs except in those glands in which there had been some prior adenomatous pathology.

In those cases where toxic changes have set in, there is usually a history of a period of about ten years during which there had been a palpable enlargement of the thyroid gland, unassociated with any other symptoms. The onset of the evidences of toxicity is insidious, in contradistinction to the comparatively acute summation of symptoms in Graves's disease. The patient usually states that at a certain time she began to feel nervous, and to have attacks of accelerated heart action. But usually about three years elapse before the palpitation, the nervousness, the tremor and the other evidences of thyrotoxicosis have sufficiently developed to oblige her to seek medical aid.

Barring the injudicious administration of iodine and thyroid products to those patients who already have an adenoma one is at a loss to explain the mechanism that prompts the change from a nontoxic to a toxic adenoma. There are four periods in the course of existence that stand out as the occasions when most goitres are developed or make their appearance. These are, 1, intrauterine life; 2, puberty; 3, after repeated pregnancies; 4, the climacteric. As a fifth period that has no definite chronological occurrence, we may add any situation that would tend to exert an unusual and excessive strain on the endocrine and sympathetic nervous systems. In consequence, we are usually able to synchronize the development of toxicity with the occurrence of a severe mental or physical shock, be it summated at once, or the summation of a succession of oft repeated minor insults, as, for example, the accumulated intoxication from a long standing focal infection. Failing in this, we are constrained to attribute the thyrotoxic change to an iodiopathic or essential aberration of functional activity.

Patients with goitre of adenoma, seeking medical attention, naturally fall into one of three clinical groups. The first is composed of those who are

concerned because of the cosmetic effect of a swelling in the neck or who fear the later consequences of such a swelling. The second group comprises those cases who suffer pressure symptoms from the swelling. The third group comes because they are troubled with the symptoms of thyrotoxicosis.

The main point of clinical differentiation between the thyrotoxicosis of adenoma and of Graves's disease is that the former lacks the eye signs that are characteristic of the latter. The tumor, the tremor, the tachycardia, the nervousness and the emotional unstability are present. In general, the cardiac symptoms are most prominent. In Graves's disease, the selective action of the intoxication is for the nervous system; in toxic adenoma it is for the cardiovasular system. There are cases which have been treated for paroxysmal tachycardia before the presence of a toxic adenoma had been discovered, and to which the cardiac condition was not attributed. With treatment of the goitre, the cardiac manifestations disappeared. The point of difference is that in paroxysmal tachycardia, the paroxysm disappears as suddenly as it comes on; in toxic adenoma, the drop is more gradual.

The basal metabolic rate is not as high in toxic adenoma as it is in Graves's disease. The actual figures, however, must be considered in a relative sense, and not, per se, taken as an indication of the toxicity. A case of toxic adenoma with a basal metabolic rate of plus 50 may be less toxic than a case of Graves's disease with a reading of plus 30.

TREATMENT

Treatment, if instituted at all, is always surgical. If the adenoma is quiescent, it may be left alone. However, frequent examinations, and at least biannual basal metabolic determinations must be made, to determine the presence of toxic change. This expectant manner of handling a case is the preferable one until the patient is well past adolescence. (3) This allows time for a firm equilibrium of the endocrine system to become established. Under no conditions must iodine or thyroid products be administered over any protracted period, for this will cause a nontoxic adenoma to become toxic. The effect of small, controlled doses of iodine on the basal metabolic rate may be used as a diagnostic test.

If at any time pressure symptoms, or any evidence of toxicity, intervenes, surgery is indicated. If surgery is not employed in the nontoxic cases, one must always bear in mind the potentiality of a nontoxic goitre of adenoma to become toxic, or, more remotely, malignant.

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The Absence of Endemic Goitre in Honolulu

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The goitre problem of the Pacific Coast, particularly of its Northwest portion, is still unsolved. Toward such a solution there has been no little endeavor, yet up to the present time no reward has been claimed. As a result of my own investigation the conclusion was reached that endemic or retentive goitre had to do with the character of the drinking water. This conclusion, however, was based entirely on personal and the general observation of others. The problem in no way is able to lend itself to actual scientific research, and this in the face of the fact of our work being carried on in a district where endemic goitre enjoys an incidence of close on to fifty per cent., namely, Portland, Oregon.

With the cooperation and guidance of no less able clinicians than Lawrence W. Selling and Franklin C. Maclean, interest in the etiology of retentive goitre gave way to that of those hypersecretive types that were accompanied by a diabetic syndrome. When further work and observation showed that this diabetic syndrome would entirely clear after lobectomy we set about to discover, if possible, just what it was in these odd cases of Graves's disease that was directly responsible for the loss of the carbohydrate tolerance.

First, was there a lesion of the sympathetic system which caused the hypersecretion of the thyroid? If so, was the same lesion capable of disturbing the secretion of the islands of Langerhans and thereby precipitating the diabetic syndrome? Again, could the hyperthyroidism produce the extreme thirst, polyuria and the ravenous appetite and the glycosuria be but a mere metabolite? But when it was continuously and invariably observed that the metabolic rate was always in proportion to the degree of hyperthyroidism and that the basal metabolism was in no way related to the carbohydrate overthrow our questions were forced to go unanswered.

In a subsequent article Selling emphasized the point by showing that the degree of hyperthyroidism bore no relation whatever to the precipitation of the diabetic syndrome.

It was during this time that Maclean was carrying on the research work, the result of which has been published (1).

The sugar content of the blood in diabetes of thyroid origin is as variant as that of the pancreatic lesion and resolves itself into that last conjecture of a hypothetical sugar threshold. But the hyperglycemia and increase of the metabolic rate which are constant findings with hyperthyroidism cannot be regarded as a step toward the development of the

occasional cases wherein the sugar mobility assumes the rôle of the pancreatic lesion.

While this reference to hyperthyroid goitre is foreign to that which the title of this article more reasonably suggests it is mentioned since it is now known that Lugol's solution is quite capable of re-

FIG. 1.—Japanese patient with hyperthyroid goitre.

storing both the carbohydrate tolerance and a marked return toward the normal metabolic rate. But the improvement is not permanent and a second administration of the drug is disappointing.

Up to a certain point only is the iodine able to stay the storm,—at that point help is needed. Whatever that help may be remains to be discovered. That the kidney function might be the factor, has nothing beyond the notion to sustain it. The results of our observation and investigations have been published (2).

Endemic or retentive goitre has not been observed in Honolulu. It was this fact which led to our comparing the water supply of the island city with that of the goitre districts of the Coast. Before making such comparison it may be of interest to mention, in brief, the presence of toxic goitre among the Oriental races of the islands.

It should be recalled that the percentage of toxic or hyperthyroid goitre is no greater within the endemic districts than it is, generally speaking, throughout the United States and Canada. This type of goitre is encountered in Honolulu but just what incidence to population has not been learned. While it is among the Japanese that it seems to be the most prevalent, once comparison is drawn between the Japanese population, the predominant of the Orientals, it immediately is made to appear that toxic goitre here occurs in about the same proportion as that noted throughout the mainland and Canada.

In this reckoning the native Hawaiian cannot be included for the type of individual that is prone to this affliction is but too seldom met among this phlegmatic people. It was Dr. Wayne Babcock of Philadelphia who first drew my attention to this, the consideration of types.

The first change necessary to start the development of endemic or retentive goitre is that which takes place in the character of the thyroid's secretion. Its consistency becomes viscid to a degree wherein it is no longer able to enter the stomatae of the lymph radicles. Accumulation within the follicles results and the gland is made to bulge proportionate to the degree of accumulation.

We conjectured that some definite arrangement existed between the secreting follicles and lymph radicles and which, if understood, would eliminate the speculative conclusions of which there were two namely,—was the thickening of the thyroids' secretion due to a faulty functioning of the follicles or was it the result of a scanty lymph supply into the follicles for the physiological thinning of their secretion? In other words, just how did the mineral free water exert its deleterious influence on the interdependence of thyroid and lymph commingling?

With this in mind a number of normal thyroids were injected, several methods of injecting being used, but no one of the subsequent sections threw the least light on the mechanics of the interrelated function of blood supply to that of lymph and the gland's secretion.

With a preponderance of evidence to support the belief that endemic goitre is caused by the character of the drinking water it is interesting, at least, to find further proof of comparing the character of the drinking water of Honolulu with that of the districts where this disease is prevalent.

The artesian water with which the city of Honolulu is supplied is one of the finest drinking waters in the world. It is unique in its low content of sodium iodide and which seems to be bound in a rather unstable way with an equally low content of the chloride of soda and potash. Calcium carbonate represents the highest per cent. of mineral content yet insufficient to cause the water to be hard. Its bacterial count is nil.

FIG. 2.—American patient with hyperthyroid goitre.

The artesian wells providing this water vary in depth from five hundred to nearly one thousand feet. An average of twenty feet deducted from the depths of each well will place the remaining number of feet below sea level.

The discrepancy in the depths of the wells is due to the elevations and depressions in the roof of the artesian basin and not to the surface location of the well. The almost continuous rainfall of the moun-

tain tops has to percolate through thousands of feet of volcanic ash, lava rock and in many places substrata of ectopic coral before reaching the artesian basin. From this it may be readily understood how such altitudes would place the plus pressure on the side of the artesian basin and prevent the waters of the ocean from finding their way into the basin.

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A Plea for Discontinuing the Use of Pituitrin in Intrapartum Practice*

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The tendency in the modern practice of obstetrics is towards the recognition of the fact that parturition is not a normal process but a pathological condition and the act of delivering the child is a surgical procedure and should, therefore, be accorded the same careful considerations that are observed in all other surgical cases.

With the advancement of modern conception of biological science, this fundamental branch of medicine, obstetrics, is being gradually taken out of the hands of the oldfashioned midwives and other quacks and placed on a scientific basis, the same as all the other branches of medicine and surgery.

To achieve the results of shortening the course of labor, numerous therapeutic agents have been introduced into the field of obstetrical practice, the most popular one is pituitrin, an extract derived from the posterior lobe of the pituitary gland. This drug is unreliable in its action, frequently resulting in prolonged and complicated maternal and fetal morbidity and increased mortality. But it is, nevertheless, used extensively and indiscriminately by a large number of general practitioners.

The profound physiological effect the pituitary extract exerts upon the uterus during the parturient stage, in increasing the tonus of the uterine musculature, has stimulated the obstetricians to adopt and use it as an oxytocic agent and place it as the vanguard of the obstetrical armamentarium.

Citing a short history of this uncertain drug, which is so extensively abused by a great number of physicians in their practice of obstetrics, will not be out of place and is as follows:

In the year 1909, Blair Bell read a paper before the Liverpool Medical Institute, reporting his experimental work with pituitrin in the treatment of placenta previa and Cæsarean section. Following these reports of the English biochemist, the laboratory men in Germany continued experimenting with this drug in obstetrics and loudly proclaimed the wonderful work and results achieved by this therapeutic agent in the practice of obstetrics.

The fame of this drug crossed the Atlantic, and according to tradition, everything emanating from Germany, so pituitrin gained rapid recognition on this continent and the medical profession in this country, having the stamp of approval of the German medical authorities, began to consider pituitrin as the magic drug which was going to substitute all our mechanical and therapeutic aids in the practice of obstetrics and was going to solve the perpetual problem of difficult labor cases, shorten the course of labor and, naturally, reduce labor pains ad minimum.

The first reports from Germany, stating that pituitrin was devoid of all dangers, made our American colleagues feel that obstetrical forceps and all the other mechanical and therapeutic aids in complicated labor cases were relegated to the past. The logical deductions one could draw from those reports were that all a physician needed was a hypodermic syringe and needle with a few ampules of pituitrin and he would be ready and fully equipped to cope with any complication that he might be confronted with in his practice of abnormal obstetrics.

While the medical men in this country were hailing the introduction of pituitrin in the field of obstetrics as a wonderful achievement, suddenly, like a bolt from a clear sky, Professor Edgar, of the Cornell Medical School, disillusioned them by reporting his experience with this drug in his hospital and private obstetrical practice. In an article (1) this famous obstetrician warned the medical profession not to be overenthusiastic over this drug. He stated:

"We consider the use of pituitrin in obstetrics as a dangerous practice, liable to cause death or deep asphyxia of the fetus, premature separation of the placenta, uncalled for deep cervical lacerations and possible uterine rupture."

Following this first warning to the medical men, similar reports began to appear in the medical literature reported by obstetrical authorities in this country and abroad. In looking over the literature on the subject of pituitrin as an aid in obstetrical practice one is surprisingly impressed with the change of opinions of the leading obstetricians regarding the usefulness of this drug in intrapartum practice.

It is the unanimous opinion of the leading obstetricians that this drug has no minimal, safe or effective dose; some patients do not respond to it at all even after the injection of several ampules and others have a precipitate labor immediately after the administration of a few minims of it.

Pituitary extract when administered even in the smallest dose during the process of parturition, frequently throws the uterus into a state of violent tetanic contractions the period of which may last from fifteen to thirty minutes. This condition of uterine contractions is beyond the control of the doctor in charge of the case, interfering with the uteroplacental circulation sufficiently to cause the death of the fetus. This same condition of the tetanic contractions may result in rupture of the uterus, especially if dystocia is present.

Owing to the uncertain and dangerous action of this drug, many physicians have modified the use of

*Read before the Bronx County Medical Society, October, 1924.

pituitrin by giving it when the head is on the perineum. But even under this circumstance, the same violent contractions may cause extensive lacerations of the maternal soft parts and may cause intracranial hemorrhages of the newborn.

When the condition of tetanic contractions follow the administration of pituitrin it cannot be remedied any more, unless the patient is immediately put under deep anesthesia and a rapid forceps extraction performed. Most of our leading obstetricians have given up this pernicious drug as an aid in the obstetrical activity, even in their hospital work where conditions are more or less ideal for emergency requirements which may result from the use of pituitrin.

Of all the deleterious drugs, in my humble judgment, pituitrin stands out preeminently as the one drug which markedly increases maternal and fetal mortality and morbidity of mother and child. Hirst of Philadelphia in a recent article on the use of pituitrin gives this drug a prominent place as an etiological factor of fetal and maternal mortality.

De Lee of Chicago said the following about pituitrin: "I consider pituitrin as a criminal agent if administered before the delivery of the child. All this drug does, is provide for the physician and his brother gynecologist a lot of chronic sufferers, often incurable even after mutilating operations. I am aware of twenty ruptured uteri due to pituitrin."

This statement was made by the eminent obstetrician at the convention of the American Obstetricians and Gynecologists and none of the delegates present at that scientific session attempted to defend the usefulness of this drug in intrapartum practice.

Winn, in a recent article on pituitrin as a dangerous drug when used as an obstetrical adjuvant, intimates that the only excuse for its employment is ignorance. He states: "If there is an indication for interference with forceps and you know how to use them, why don't you use them in preference to this dangerous drug?"

The advocates of pituitrin in intrapartum work assert that the dangerous effects resulting from this drug are due to any one of the three following causes: 1, improper dose; 2, improper indication, and 3, improper surroundings.

That these assertions are at variance with true facts may be shown by statistics collected and compiled by medical authorities of their own school, on the effects of this glandular extract. Mandel, himself an advocate of pituitrin in the practice of obstetrics, made an exhaustive study of the effects of this extract upon the mother and child, by analyzing a series of 1,293 cases and the results (2), as published under the title The Present Status of Pituitary Extract, are as follows:

Ruptured uteri	12 (1 in 106)
Fetal mortality	34 (1 in 38)
Asphyxia pallida	41 (1 in 32)

Ingraham and Chase give the following dangerous results of this popular drug, which is so extensively used by a number of general practitioners and which, at one time, was reputed as being devoid of all dangers:

Number of cases treated	33
Number born asphyxiated	6
Fetal deaths	2
Severe postpartum hemorrhage	7

A few figures taken from the records of the Virginia Memorial Hospital, which has a large obstetrical service, will not be out of place. Two series of equal number of cases treated impartially, with and without pituitrin and the following are the results:

No. cases		Infants' deaths
With pituitrin—34		8.8 per cent.
Without pituitrin—34		3.4 per cent.
Free from laceration	First degree laceration	Second degree laceration
32.3 per cent.	35.3 per cent.	32.3 per cent.
68.4 per cent.	27.1 per cent.	11.8 per cent.

I would like to emphasize that these figures were obtained under ideal hospital surroundings and managed by highly competent, impartial, actively engaged obstetricians.

Some physicians have discarded this drug in obstetrical practice, but not entirely, using it only in cases of socalled uterine inertia and in the third stage of labor. But does this condition, called uterine inertia, justify the risk of administering this pernicious drug, which may prove fatal to mother and child, especially when used by the general practitioner in patients' homes without the proper conditions for emergency requirement?

Professor Edgar, in an article on pituitrin, states: "Pituitrin should never be employed for uterine inertia in any stage of labor, unless anesthesia is at hand and preparations have been made for immediate operative delivery should the accident of uterine rupture follow its administration."

But what is that condition called uterine inertia, which would in any way justify the injection of an uncertain, dangerous drug? This is, as we all know, a condition of muscular atony or relaxation of the body of the uterus resulting from uterine overexertion following usually a tardy and prolonged course of labor. It is a state of physiological reaction following a prolonged and continuous hyperstimulation of the uterine musculature, caused by the secretion of the pituitary gland upon the susceptible uterus during the various stages of labor.

This condition of uterine inertia is, therefore, one of uterine exhaustion. Like any other muscular organ the uterus loses its strength, power of contractility and tonicity after it has undergone a prolonged process of muscular contractions. It finally acquires a state of muscular exhaustion during which condition the uterine muscles do not respond any more to the stimulating effect of the pituitary secretion, which is normally present and supplied by the pituitary gland through the various stages of labor. Uterine inertia is a normal physiological reaction, nature intends the uterus to rest, in order to regain the normal strength of its muscles. Practically and rationally we should, in this condition of uterine relaxation, administer an anodyne, instead of the pituitary stimulant, to help the work of the physiological process.

To my mind it is a physiological error and a rationally therapeutic contraindication to continue artificially stimulating an already overstimulated organ, when the latter is in the course of returning to its normal or preexhaustive state of muscular tonicity and contractility. This biological axiom holds true for all animal organs, be it the heart, the stomach, the intestines or the brain. Then why should the uterus be an exception to this physiological law?

With regard to the usefulness of pituitrin during the third stage of labor mentioned previously, I wish to make a short quotation from an extensive report by Reist and Gugenheim (1).

1. The average duration of the third stage was not shortened. Occasionally it was prolonged by the appearance of a stricture at the internal os of the cervix, the formation of Bendal's ring.

2. The average loss of blood was not diminished and the antihemorrhagic effect was not observed. The profuse hemorrhages were increased.

3. Disturbances during the third stage occurred more frequently, because the placental labor pains induced by the pituitrin often appeared before the uterus reached the stage of retraction.

As we see, there is no benefit derived from the use of pituitrin even in the third stage, on the contrary, complications frequently result. With regard to the effect this drug has upon the newborn, may be seen from an overwhelming number of fetal deaths reported in the medical literature, even by the strongest advocates of pituitrin as an obstetrical aid. The causes of these fatal accidents are numerous; the most common of which are the following:

1. The violent and prolonged uterine contractions with the very short intervals, caused by the administration of this drug may result in the constriction of the placental cite, thereby limiting or cutting off the blood supply to the placenta, causing the improper oxygenation of the fetal blood which inevitably results in asphyxia neonatorum.

2. Premature separation of the placenta.

3. The constriction of the cord between the uterine wall and some fetal hard part, such as sacrum, trochanter or shoulder, produced during a violent and prolonged uterine contraction. In addition to the dangerous effects upon the fetus and the maternal pelvic organs, pituitrin also exerts a deleterious strain upon the heart muscle.

1. By raising the blood pressure it throws an additional load upon the heart.

2. By causing the constriction of the coronary vessels it lessens the flow of blood to the cardiac musculature and thus interferes with the proper nutrition of the heart itself.

While I am opposed to the use of pituitrin in the practice of obstetrics, I do not want to be accused of defending the policy of *noli me tangere*. I believe it is the duty of the physician to lessen the pain of childbirth and shorten the course of the process.

In conclusion I wish to state that the results as reported by the leading obstetricians in the literature point definitely to the undeniable fact that pituitrin, in the field of therapeutic usefulness in the practice of obstetrics is limited. It is a drug too dangerous and too unreliable even in the few cases where it may be indicated. This drug carries with it more dangers than benefits to the patient.

I wish to close with the following remarks by Dr. Haskell: "We do not wish to convey the impression that the use of pituitrin always results in catastrophe; the vast number of cases in which there was no apparent injury renders this attitude absurd. We do believe, however, that there is always the possibility of harm resulting even from the socalled safe dose a danger so real that it is scarcely justifiable to risk it for the sake of the few added hours of rest or those left free to be devoted to other tasks by the obstetrician."

The author's references will appear in his reprints.

Some Problems Which Endocrinology Presents

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The problems which endocrinology presents today are presided over by two groups, one composed of physiologists and research workers, and the other the clinicians. The former stands superior within the confines of his laboratory and experimenting on isolated tissue and nonhuman animals announces his results to a receptive world. The latter busily caring for patients and numerous hospital duties approaches the human being and pragmatically cures patients and draws conclusions which are often astounding and are said by the research worker to be unscientific. This is the age long fight between the two, but together, and in the hands of both, really lies the ultimate future of our fullest knowledge of the glands of internal secretion. Up to the present time the odds are entirely in favor of the clinician for most of the syndromes described, and the therapeutic advances have come from their efforts.

The main difficulties which seem to rise in our path are, first, to which gland or combination of glands belong a particular series of symptoms, and second, what are the fundamental factors which produce these glandular dyscrasias; and lastly, wherein do we fail in a therapeutic approach?

The symptoms which patients present that are superficially explained or called "nervous" are often unsatisfactory both to the physician and the patient. Many of these we are beginning to classify and will undoubtedly in the future elaborate in the classical syndromes of diseases of the glands of internal secretion. Take, for example, the young girl who becomes suddenly fat, has headaches, and grows hair on her chin, arms and abdomen; or one whose menses stop suddenly at twenty-two with the development of headaches and five years later shows the early signs of acromegaly, optic atrophy, etc. If these symptoms, which later show themselves to be unquestionably due to the pituitary, had been recognized at their onset, how much more chance they would have for a future of health without growth deformity.

Into what group are cases of socalled migraine going to fall. At the present time many of them are materially helped by glandular medication and surely

their clinical picture of low blood pressure, slow pulse, low blood sugar and CO_2 combined with vomiting of a reflex type, bordering on the acidosis picture, suggests an obscure biochemical glandular basis. How many headaches are pituitary in origin? The typical pituitary headache which (1) I described in 1917, located intratemporally, is now commonly accepted but there are many which have not such a striking location.

What proportion of the subjects who are chronically below par, presenting fatigue syndromes, varied stomach and intestinal symptoms, showing idiopathic skin diseases; women who have days and weeks of physical discomfort and economic interference because of menstrual difficulties, for which no definite organic foundation can be determined; unless we invade the realm of the endocrine glands.

My first interest in this subject began at the Neurological Institute, where it was found that there was a large group of patients whose symptoms were not due to organic neuraxial diseases, they were not due to a mental disease, nor to any psychological maladjustment expressed as a hysteria or a psychoneurosis. A definite approach was found possible along the lines of endocrinology, it explained their symptoms, it provided a therapeutic approach. The endocrine field in nervous diseases is ever widening with our advancing knowledge of the interpretation of the glands of internal secretion and nervous symptoms. Other pioneers in this field are not primarily neurologists and because of their broad interests are developing possibilities in another group of patients. Draper (2) of New York, by accumulating anthropometric data, has attempted to classify certain definite types subject to gallbladder disease, renal disturbance, etc., while Englebach has approached the endocrine glands from the broad viewpoint of the internist.

We are familiar with acromegaly, myxedema and hyperthyroidism and their symptoms are well accepted, but the factors which lead up to the production of the syndromes are facts which most of us feel incompetent to state. Cases of acromegaly may be due to numerous causes and it is rare to see only the pituitary gland involved. This is true of practically all endocrinous disorders; there is a delicate balance between the glands, some being antagonists, some synergists.

The popular vogue of one of our present day postcard publicity drug firms is due to its leader having capitalized this knowledge, and working upon the old "shotgun" fallacy, has formulated a series of pluriglandular mixtures prescribed by number in order to make it easy for the physician and save him the trouble of learning. It is my belief that to prescribe any gland without a definite indication known to oneself is not only unscientific but bad practice.

Under these circumstances symptoms must be correlated with a particular gland and though it is known that several glands seem to produce the same symptoms, it is our province to so analyze them as to eventually localize it to a single basic gland. With the further elaboration of glandular syndromes, this will become more and more possible thus eventually solving the first of our difficulties.

In trying to bring this about we must not overlook any of the diagnostic aids. It is necessary to observe the conformation of the bones externally, which include facies and skeletal disproportions and abnormalities; the progress of ossification at the epiphyses; the size, shape of the sella turcica and its comparison with the patient; the presence of a thymic shadow in the upper mediastum; whether there is a tubular heart as in status thymic lymphaticus, etc. Radiography will reveal all these. The texture of the skin, its color, its tendency to moisture or dryness, its reaction to stroking with the finger, its growth of hair, both as to quality and distribution, and its tendency to production of fat and deposition of pigment, are also important diagnostic aids. Likewise must be considered the shape and development of the teeth and nails. The muscular status is at times disturbed and indicates a possible endocrinopathic basis. The genital development is subject to considerable variation in glandular disorders and must be correlated with the remainder of the picture. Keen clinical observation is necessary to observe slight variation from a supposed norm and who of us really has the normal bodily conformation? Are we not all therefore the product of our glandular balance or imbalance? Blood pressure under basal conditions, pulse variations, oculocardiac reflex and the reaction of these to certain drug injections, such as adrenalin and pilocarpine, should be noted.

Beyond this it has been found that in the laboratory field many tests are of great value, but a heightened basal metabolic rate does not always mean a hyperthyroidism, nor does an increased blood sugar a pancreatic diabetes. A sugar tolerance curve serves as a differentiating aid, while a low blood sugar, as our experience with insulin is teaching us, will give symptoms almost as trying as though too high. The blood carbon dioxide, calcium, and coagulation time may show variation in certain endocrinoses, as may the blood count. Many biochemical disorders of the blood are as yet quite beyond our diagnostic acumen but within this field is a large opportunity to expand our knowledge of endocrinology.

If we wish to state briefly the accepted clinical judgment as to tissue growth in relation to a particular gland we must look upon bony growth as being dependent upon the thymus, pituitary, thyroid and gonads. Skin conformation, i. e., texture, color, etc., upon the thyroid and thymus; hair type upon the thyroid, pituitary, adrenal (cortex), and gonads; teeth upon thymus, pituitary, thyroid, adrenal (cortex), gonads; genital development upon thymus, pituitary, pineal, gonads, and adrenal (cortex); muscular growth and function upon pineal; parathyroids, perhaps also the adrenal. In addition to these tissue alterations or variations dependent upon the endocrine organs the blood pressure has controlling it the pituitary, adrenals, and thyroid blood clotting gonads, adrenal, thyroid; sugar metabolism pancreas, pituitary, adrenal and thyroid, etc. This list, though not complete, gives a definite idea as to the interdependence of function and the unquestionable polyglandular nature of all endocrine dyscrasias. The possibility of one gland being alone disturbed is seemingly improbable, the combinations being as many as the variants. One gland, however, is basically diseased while the others become so in an effort

to compensate or because of a failure in their interdependence.

The second large difficulty which besets our progress is largely from a deficiency in our knowledge as to etiology.

Inherited determinants in the field of glandular organs are subjected to the same laws as govern other biological structures. Mendel's (3) original hypotheses apply likewise to the endocrine glands, but dominants and recessives in their reactions produce widely different results upon individuals and one family may produce a great variety of glandular syndromes. Endocrinopathic inheritance determines our physical type throughout and we therefore show resemblances to our parents, or just as often to a more distant relative. Goitre families are well known, families of giants are common, as are dwarfs, and how common it is that a marked variation in height occurs between a husband and wife; the result being a *more perfect* endocrinological offspring.

A study of family anthropological types will reveal often interesting data and glandular dyscrasias will be found; dwarfs, diabetes, giants, goitre, etc., all in the same family group. What then the inheritable factor? It may be a stock deficiency running through the entire family, e. g., pituitary, thyroid, etc., the clinical syndromes occurring as a reaction of that particular individual to the family deficiency. This is seen very commonly and emphasizes the acute importance of family charts in caring for these patients.

The occurrence of certain epochal milestones in our life history with their resulting glandular rearrangements makes for a possible error in their development. At birth the existence of a congenital absence of the thyroid, gonads, etc., is evident when the maternal circulation no longer supplies the necessary hormones. This is really more due to a developmental defect perhaps contributed to by an endocrinopathic inheritance. The next outstanding epoch which both sexes must meet is that which occurs in the passage from adolescence to maturity, namely puberty. A striking readjustment of glandular balance occurs at this time, the thymus gland has gradually atrophied, the pineal is beginning to be calcified, both of the organs ceasing to function normally by this period. This cessation of function seems to be connected with the proper and normal development at puberty of the gonadal elements, perversion of function resulting in accelerated or retarded sexual growth or failure of proper sex differentiation. With the normal appearance of the secondary sex characteristics, including hair growth, change in voice, development of the mammæ, etc., accompanying puberty, is the accretion of growth and the final set of the bony and bodily build as determined by the pituitary, thyroid, gonads, etc. An extraordinary emotional and intellectual change occurs also at this time, probably the stability of our emotional life at this period depending upon a proper balancing of our endocrine sympathetic chain. In the female the pregnancy epoch is another time when glandular disturbance may occur and we frequently see thyroid dyscrasias, a thickening of bones and tissue with headaches due to pituitary disorders, obesity and numerous other signs obviously glandular. The final epoch is the menopause, when with a cessation of ovarian activity there is commonly associated momentary hyperthyroid episodes and more rarely a goitre or myxedema. The normal symptoms of the menopause are due to an ovarian thyroid imbalance, while abnormal symptoms often involve many of the endocrine organs. Let us not forget there is also a definite male menopause which, though it has its glandular components, is strikingly a period of psychological readjustment and it must be reckoned with clinically from time to time. Thyroid, orchitic and rarely corpus luteum (in those of *feminine* type) may be of avail in these cases.

Another interesting basic causative factor in the production of endocrinopathies is trauma. Owing to the location of the pituitary gland at the base of the skull, it is in a favorable site for injury. That this occurs is borne out by facts because syndromes referable to disturbances of its function have been repeatedly seen as a sequel of head injury. Fractures of the base with direct involvement of the sella turcica or hemorrhage about it are the most common cause; while fractures elsewhere with resulting contra coup are seen; while trauma of the skull even without fracture has caused pituitary injury. Our more recent knowledge through excellent experimental (4) work opens up a wide field of speculation because of the association of hypophyseal syndromes with a lesion of the hypothalamus and floor of the third ventricle, so therefore it seems possible that basilar injuries may disturb either structure and produce signs of glandular dysfunction. Acromegaly, Froehlich's dystrophiagenitalis, diabetes insipidus, etc., are seen as the result of these traumata. Injury rarely causes any functional disorders of the thyroid parathyroid group, while because of the deep seated position of the adrenals they rarely show symptoms. However, deep abdominal injuries and high lumbar traumata may cause signs of sudden adrenal depletion with shock followed by a chronic hypoadrenalemia. Injury to the testicles rarely produce any dyscrasia but ovarian trauma from pelvic operations or very rarely from without may cause acute or chronic hypoovarian symptoms.

Another exogenous factor producing an endocrinopathy is infection. In childhood the contagious diseases are frequently a starting point for the long history of a chronically unhealthy child, very often due to thyroid and adrenal disease produced by their toxins. This is particularly due to the toxins of scarlet fever, diphtheria and poliomyelitis, while the orchitic and ovarian atrophy resulting from mumps is well known.

In adolescence, influenza and its closely related cerebrospinal disorder, epidemic encephalitis, are the cause of many endocrinous symptoms. Hypopituitarism, hyperthyroidism, hypoadrenalism, etc., are types commonly seen after these diseases. Certain other cerebrospinal infections and diseases affect the pituitary, pineal, etc. Certain chronic diseases also have a predilection for the endocrine glands. Tuberculosis chiefly involves the adrenals, causing low blood pressure, pigmentation or a true Addison's disease, while its concomitant thyroid picture often makes an early differential diagnosis impossible from hyperthyroidism. Pottenger's first interest in the sympathetic nervous system and the glands of inter-

nal secretion seemed to come through observations among his tuberculosis patients. Syphilis will cause pituitary syndromes, tabes dyspituitarica being a symptom complex described before anything much was known about either of these conditions. A hypothyroidism is seen accompanying lues, as is sometimes an adrenal disease.

Chemical deficiencies, either exogenous or endogenous, are important factors in maintaining a normal function of the glands of internal secretion. Those in the northern part of New York State must fully realize the importance of iodine. Rochester and numerous middle western cities have added it to their water supply. Others are considering doing the same in those parts of the Great Lakes district which fall within the iodine deficient or goitre belt. This district also includes certain parts of northern New England and large areas in Europe, around the Alps, in the Carpathians, and in southeastern Russia. A knowledge therefore of the individual's geographical history becomes essential in understanding an endocrine disorder. A proper chemical concentration of iodine is essential for the full utilization of thyroid, though its other metabolic components are not now appreciated. Sodium iodide or Lugol's solution must be used not only from the viewpoint of prophylaxis but also in the treatment of colloid goitre, hypothyroidal states and in those cases which suggest iodine deficiency. We have found a definite group of cases with hyperthyroidal symptoms even simulating the Graves's syndrome which have been cured by iodine and thyroid extract.

The problem now before us is this; if iodine assumes such an important rôle in the stabilization of our bodily economy, particularly the thyroid, what other chemical elements must we reckon with in order thoroughly to understand our endocrine etiology. Calcium is an important adjunct to parathyroid function, while the ingestion of too much sugar will result in an endocrinopathic defect. In this latter connection the rôle of the islands of Langerhans have been purposely omitted from this paper because they are so thoroughly considered elsewhere. Certain of the metabolic poisons, lead in particular, seem to have a predilection for the endocrine glands. In one family group a member of our clinic, the original glandular dyscrasia came from a grandparent who was a painter, muscular dystrophy being the final endocrine endproduct. Other chemical and biochemical products must undoubtedly play a large part in producing endocrinopathies if our knowledge were only capable of grasping them.

Tumors either of the gland itself or pressing upon it from without will produce either destructive or irritative symptoms. These may be of a teratomatous type, or benign, or malignant. The association of tumors of the suprarenal cortex with sexual peculiarities is quite well accepted at present, due no doubt to the known common embryological origin of that structure and the gonads. Other glands present clinical syndromes familiar to all of you, though we must not overlook the fact that a very destructive tumor of any of the glands mechanically speaking is quite possible without any distortion of tissue or growth occurring, e. g., complete destruction of the middle fossa may occur with involvement of the pituitary without any acromegalic or hypopituitary signs, though local neurologic signs may be prominent. Why this is possible is not yet understood.

Within the realm of our psychic life we acknowledge a close interrelation with endocrine glands. McDougal (5) says that our temperament is dependent upon a proper balancing of our bodily organs and of course of these the glandular mechanism is predominant. The temperament being a fundamental almost instinctive element of our personality, the larger conception is also true.

We therefore must look upon the personality as having an organic element in our endocrine glands which factor has presumed one overenthusiastic writer to fill a book on this subject. How much they condition our personality is not known but those who see patients in both fields are struck by the predictable personality characteristics on the basis of more easily diagnosed glandular type.

Emotional crises resulting in hyperthyroidism, adrenal disorders, and pituitary diseases are not infrequently seen, while who of you have not known of cases where menstruation ceased acutely or chronically on the basis of some emotional shock!

Conversely, we see endocrinopathies resulting in disorders not only of the personality, but invading the realm of psychopathology. Any psychiatric hospital will show its quota of hyperthyroids, cretins, myxedema, hypoovarian states especially at the menopause, and if we are to accept the more recent researches of Mott, dementia precox is etiologically a testicular disorder. A large group of the psychoneuroses have associated with the psychological maladjustment a glandular imbalance which is amenable to therapy.

There are undoubtedly many more etiological factors producing endocrinopathies, but here again we have only as yet scratched the surface of a fuller understanding of the causes.

Something is wrong with glandular therapy. This thing is the cause of our therapeutic failures and it lies basically in the realm of biochemistry. What a change has occurred in the treatment of diabetes since a new method of extraction of the pancreas produced insulin. Our diagnostic acumen has far outstripped our therapeutic results. For one reason we have had a smoke screen thrown upon us by the venders of pluriglandular formulæ, mixed glands, and hormotones. It will take some time to shake off their deleterious effect upon our therapeutic skill. In addition we are provided with single gland products in dried form, extracts, and in ampules for hypodermic use. The latter are better standardized and do not deteriorate, while the former two do not conform to these demands and neither are they particularly fresh. And yet you and I use them constantly, sometimes obtaining striking effects and again not. Then again for example, take adrenalin, it represents probably one of the many substances secreted by the suprarenal gland and this gland has two distinct portions. Some say it has no effect except by hypodermic injection; that may be so, as measured by laboratory methods, but why does it cure certain types of seasick individuals when given under the tongue or in the back of the throat? Pituitary, thyroid, corpus luteum, ovarian, parathyroid, all have an effect when given by mouth but failures are seen.

The millennium of glandular therapy will arrive when it has been possible to extract from each gland its many chemical components so that stimulative and substitutive therapy are possible. To do this is without the realm of our present knowledge and it is upon this field that we must concentrate in order to hasten the day. When it comes there will be an "insulin" or several "insulins" for each gland of internal secretion.

The author's references will appear in his reprints.

Observations in the Mildest and Earliest Cases of Diabetes Mellitus

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As a rule both in clinics and in private practice the twenty-four hour urine is collected and used in making the dextrose test. The life insurance companies are becoming more cautious than formerly and demand samples of urine voided two hours after a test meal in doubtful cases.

In the mildest and earliest cases of diabetes mellitus the glycosuria is intermittent. The dextrose concentration of the blood on fasting is normal or at least below the renal threshold value. When carbohydrate rich food is taken, the blood sugar may reach, or temporarily exceed, the renal threshold for dextrose and may cause transitory glycosuria. The duration and the degree of the glycosuria depend in the individual case upon the severity of the disease and upon the form and quantity of the carbohydrates ingested. In the mildest cases the rise of glycemia may last only for an hour, or even for a few minutes, and the glycosuria which is usually very slight is also present for this short period only.

Transitory glycosuria is characteristic of Maclean's renal glycosuria and also for those cases of diabetes mellitus which were described by Maclean as showing "lag" curves, i. e., cases in which the glycemia after administration of glucose surpasses the renal threshold, but returns to normal within two hours. In both instances the blood sugar concentration returns to the fasting value within two hours and the glycosuria cannot last longer than that time, and is usually of shorter duration.

In true diabetes mellitus the time required for the rise of the blood sugar and the duration of the glycosuria are as a rule longer, but even in these cases the glycosuria is intermittent in character. It can also occur that a more prolonged hyperglycemia is followed by a shorter period of glycosuria, for example in cases in which the elevation of the blood sugar value remains for a shorter period above the renal threshold value and there is a relatively longer time during which the value lies between the highest normal and the renal threshold value. In all these cases it may easily occur that the twenty-four hours' urine is free from sugar and so no diabetes can be detected by the analysis of the *collected* urine. In the same cases, however, careful examination of the urine samples voided at short intervals after the ingestion of carbohydrate rich food, or after the sugar tolerance test, may still reveal dextrose. When several samples are taken during ten to fifteen minute intervals, it may happen that dextrose can be detected in only one or two of them, possibly in a very low concentration—merely traces or in amounts ranging from 0.10 to 0.15 per cent. Again it may be that the two hours' urine after the test meal contains some slight quantity of sugar, but when the bladder is emptied after four or five hours, the sugar reaction in this portion of the urine may prove negative. It also may occur that the two hours' urine does not give a positive dextrose reaction, but that one or two of the fractional portions, voided separately at fifteen minute intervals, does react positively.

The making of a decision as to the nature of a slight quantity and postcibal temporary appearance of dextrose in the urine, which is, according to the writer's recent observation, rather a frequent finding, is often very difficult. Sugar tolerance tests of the urine and blood must be resorted to in such cases and the results of this test may decide this important question. A positive test can be considered as proving the case. Failing increase in the degree of glycosuria in the fractional urine portions after administration of fifty or one hundred grams of dextrose, or lack of hyperglycemia, or return of the blood sugar to the fasting glycemia value within two hours, leaves the case undecided and requires further observation and renewed examination.

The result of the sugar test also depends to a great extent upon the concentration of the urine. Benedict and others (Newirth, Kast, Crole, Meyers) found that the normal urine collected in twenty-four hours contains about one gram dextrose, and also that 0.05 per cent. concentration of dextrose is the minimum amount which can be detected by the usual laboratory tests. When a normal person voids two litres of urine in twenty-four hours, the sugar test is negative, while when the urine is more concentrated and the daily quantity does not surpass 0.75 or 1 litre, the concentration of the dextrose in the urine may reach 0.10 per cent., which can readily be recognized by positive sugar test. When the same quantity of dextrose is diluted to two litres, the reaction may be negative.

In the mildest, earliest, or suspicious cases of diabetes mellitus the urine should be examined during the two hours following the ingestion of a carbohydrate rich diet or test meal. Special attention should be given to portions of the urine taken, at fifteen to thirty minute intervals during the period from forty-five to seventy-five minutes after administering the test meal. The dextrose test in the twenty-four hours' specimen is not adequate to decide the important question of a beginning diabetes.

This leaves the matter of the blood sugar estimation an open question. When before the test meal the blood sugar is normal and the sugar test in the urine is negative, but after the test meal the blood sugar rises above the physiological threshold, diabetes mellitus is present. If the blood sugar does

not exceed the normal renal threshold (0.18 per cent.), there is no diabetes mellitus. In this latter case, if glycosuria appears, Maclean's renal glycosuria may be postulated; if both the glycosuria and the hyperglycemia (above the renal threshold) are absent, no pathological condition whatsoever is present. If after the test meal the blood sugar returns within two hours to the value before the test meal was taken, there is in the absence of glycosuria no pathological condition present; or if glycosuria sets in, Maclean's renal glycosuria or diabetes mellitus with "lag." Marked delay in return of the blood sugar to normal, even in a case showing no glycosuria, is suggestive of diabetes mellitus.

The tolerance for carbohydrate in diabetes mellitus can only be insufficiently expressed and characterized by one number. Different amounts of carbohydrates can be tolerated according to the carbohydrate percentage of the foodstuffs. A diabetic may have a tolerance for one hundred grams, taken in foodstuffs containing fifty or over fifty per cent. carbohydrate, while the same patient at the same time can tolerate, without glycosuria, two hundred or even more grams of carbohydrates taken in vegetables containing three to five per cent. carbohydrates.

Aside from the quantity, the manner of the distribution of the carbohydrates ingested can modify the degree of the tolerance manifested by the patient —whether the same amount of food is taken at one time, or is divided into two, three, and four parts, naturally influences the utilization of the carbohydrates. In expressing the degree of the tolerance it is important to give the figure for twenty-four hours, but it is equally as important to *express the tolerance for the single meals.* When a diabetic can utilize seventy-five grams carbohydrate taken at one meal he can tolerate 150 grams of carbohydrate, when he takes one half of this amount twice a day, 225 grams when he takes one third the amount three times a day. It is important to divide the carbohydrates to be given in twenty-four hours into three nearly equal parts, or even a smaller fourth additional meal can be taken at a late evening hour, especially when the third meal, the supper, is taken at an early hour. I will not say that it is of no consequence from the point of view of the tolerance whether the system becomes charged or overloaded with the maximal dose of the carbohydrates that are well tolerated, once, twice or three times a day, even though the blood sugar elevation with the following glycosuria disappears within the period of time between two meals; on the other hand, the failure would be still greater if one did not take advantage of the ability of the system to metabolize the carbohydrates within a few hours and to be ready after that time to utilize the next similar carbohydrate ration.

It is also of great importance to know, and well worth while emphasizing the fact, that a diabetic usually can tolerate much more carbohydrate in the evening than in the early morning hours. Taking this into account, the proper division and distribution of the carbohydrates should always be arranged to the best advantage of the patient.

In the mildest cases of diabetes the proteins should only rarely be restricted, i. e., in cases in which administration of protein actually increases the degree of the glycosuria. As cases of this type are very seldom met with, one need not often resort to this measure.

The diet, in the mildest cases, should differ from that of a healthy man as little as is absolutely necessary. To impose a strict and unnatural diet in such cases is neither necessary nor wise.

Desiccated Gonadal Substances*

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In an earlier communication one of us in collaboration with Corscaden and Lyle (1) presented a theoretical consideration of the problem of preparing for oral administration organic tissue wherein the chemical nature of the therapeutic principle or principles was unknown. Based on such considerations we prepared whole ovarian substance, began a clinical study of its value and felt justified in the conclusion that whole ovarian substance was a specific remedy for the socalled flash symptom of the menopause. Further clinical study (2) impressed us with the genuineness of the therapeutic value of the desiccated whole ovarian substance.

We must bear in mind the fact that all observers are not using identical chemical mixtures in ovarian feeding. In theory, at least, this offers a difficulty that makes it impossible for the present to accept a negative result of one observer as offsetting a positive one for another. Therapeutic failures may still be ascribed to improperly prepared gland substance.

Ignorant of the chemical properties of the units we are seeking to preserve in the preparation of gonadal tissues we must aim to retain in the finished product, as nearly as possible, all the physicochemical properties of the many entities in the untreated materials. More specifically this means: 1, avoiding the coagulation of the protein; 2, the liquefaction of the fats, 3, oxidation reactions, 4, reduction reactions and, 5, hydrolytic cleavage. Such results can only be attained by desiccation done rapidly at low heat and high negative pressure (in vacuum) in the presence of a minimum of circulating air (oxygen). Significant differences in the technic of preparation of gonadal substances ought to show themselves in the findings obtained from such simple procedures as the determination of ether soluble and water soluble fractions in samples of the finished product.

*The Plaut Fund for Research in Internal Medicine, Harriman Research Laboratory, The Roosevelt Hospital, New York City.

The products from three different sources were analyzed. Product A was prepared after the directions outlined in a previous publication. Products B and C were ordered in powder form direct from two of the better known manufacturers. We had the manufacturers of C furnish not only their stock powders of whole ovaries and corpora lutea, which are made primarily from the cow, but also similar materials wholly from the sow, from which latter animal the ovarian products A were prepared. A study of the table given below with special reference to the values of the several fractions in products C indicate that the animal source of the substance may be ignored as a factor in our findings.

Ether soluble fraction.—The analyses show that all the C products are defatted and that orchic product B is also defatted. Much speculation has been offered upon the proposition of the therapeutic utility of gonadal lipoids. While no definite conclusion is available the indication to the pharmaceutist is distinct. He should strive to preserve these fatlike bodies. Defatting should be proscribed. If the ether soluble fraction in the dried material is over twenty per cent. it is difficult to pulverize the material; for this fat mixture tends to adhere to the attrition prongs of the pulverizer and shortly succeeds in clogging the machine. This is the case with orchic substance and we imagine that it is for this reason that the manufacturers of products B resort to defatting for their orchic substance while avoiding it in their ovarian materials. Nevertheless, with extra effort and care in pulverization it is mechanically possible to reduce orchic substance to powder without defatting. Since it is impossible to know the extent of the changes induced in a highly complex organic mixture by the use of a fat solvent—or indeed by the use thereon of any chemical agent,—we must in the light of what we are endeavoring to accomplish by proper desiccation, consider a chemically treated mixture as a preparation distinctly inferior to one not so treated.

Total nitrogen.—These values call for no particular comment. These tissues contain about eleven per cent. nitrogen after desiccation. Where the material has been defatted there is of course a percentage increase in nitrogen measure. This accounts for higher nitrogen figures in defatted products.

Total soluble nitrogen.—These fractions were estimated from extractions with distilled water, a very faintly acid or neutral solution and water made slightly alkaline to phenolphthalein. Throughout all the samples there is greater solubility in alkaline solution. Extractions in alkaline medium tend to bring the nucleoproteins into solution and we may reasonably ascribe to this fact the greater solubility in the alkalinized water.

Given in the last two columns of the table is the percentage measure of the soluble nitrogen for both the neutral and alkaline water extracts. For the comparable extractions products A show from fifty per cent. to one hundred per cent. greater values for the soluble fractions of the total nitrogen. This is a sizable difference. It indicates a defect in the technic of preparation of products, B and C. It seems a fair assumption that these latter products have been submitted to too high a drying temperature; this resulting in the coagulation of some of the protein. As opposed to products A those of B and C may be considered as desiccated with high heat. It would lead us into needless and futile speculation to theorize on the many other possible by-effects upon complex organic materials in the presence of elevated temperature; increasing reaction rate, aiding oxidation and favoring hydrolysis and other factors.

PRODUCT	Ether soluble	Total nitrogen	Soluble nitrogen water (neutral)	Soluble nitrogen water (alkaline)	Nonprotein nitrogen in water (neutral)	Nonprotein nitrogen in water (alkaline)	Per cent Total N soluble water (neutral)	Per cent Total N soluble in water (alkaline)	Tissue
A.	16.0	11.1	4.8	6.1	2.6	1.2	43.0	55.2	Whole Ovary
B.	14.7	11.4	3.1	3.8	1.7	1.4	27.4	32.8	
C. (Stock)	4.4	11.8	4.2	5.5	2.4	1.7	35.5	46.7	
C. (Sow)	4.5	12.8	3.8	5.4	2.4	1.9	29.4	41.8	
A.	20.2	10.4	4.2	5.82	2.8	1.3	40.0	55.8	Corpus Luteum
B.	18.1	10.2	2.1		2.3		20.7		
C. (Stock)	2.8	12.9	2.9	3.5	2.8	1.4	22.1	27.4	
C. (Sow)	3.6	13.5	2.8	4.3	0.5	1.3	20.8	31.7	
A.	11.8	11.7	4.9	5.4	1.1	1.3	41.7	47.0	Ovaria Residu
B.	7.6	12.9	2.5	3.0	1.4	1.3	19.0	22.5	
A.	23.3	9.7	4.1	7.0	1.9	1.6	41.0	72.0	
B.	12.1	11.8	2.7	4.2	2.3	2.4	23.0	35.6	Orchic Sub- stances
C.	9.7	11.9	2.5	2.8	2.0	2.0	21.0	23.2	

*The value for each fraction is expressed as parts per 100 by weight in original sample.

However, the clinical test is still the court of the last resort for judging the efficiency of preparations of ovarian and orchic substances. And because of the existing possibility that therapeutic failures may be due to improperly prepared endocrine material it behooves us to study as closely the endocrine product we administer as the clinical condition in which the therapy is applied.

Working in the dark to preserve therapeutic principles of totally unknown chemical properties makes it impossible for one to dogmatically indicate a right and a wrong way of attempting the preservation. We believe, though, that the premise laid down at the outset of this presentation that ideally the aim should be one of preserving everything in the fresh glandular material is thoroughly sound. Judged by such a standard methods of preparation could be comparably evaluated. Such an evaluation for the products herein analyzed would indicate products A as made by the best method.

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Historical Medicine

Medicine in the "Good Old Days" *

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Auber in his interesting *Traité de la Science Médicale,* Paris, 1853, (1) gives an account of twenty-six schools of medicine from the time of Hippocrates down: and he blames the Arabian School founded in the 11th century by Rhazes and Ali-Abbas (2) for "that disgusting polypharmacy so long in vogue among the common people and among physicians . . . follies which had credit of Medicine in the 16th and 17th centuries."

The attribution of these disgusting follies to the Arabian School is unjust; but I do not intend in this paper to discuss the source of these follies—I shall only mention a few of them appearing in a work of vast erudition, a *vade mecum* and book of great authority in its day.

Moses (Moïse) Charas (3) in 1673, published at Paris his *Pharmacopoeia* which appeared in English at London in 1678 under the title *The Royal Pharmacopoeia, Galenical and Chemical Englished.* Louis Guillaume Lemonnier, afterwards one of the (4) Royal Physicians to Louis Quatorze and then to Louis Quinze and Louis Seize (1700-?), published in 1753 an improved edition in French and Latin at Lyons which was translated into all the languages of Europe and even into Chinese—Monnier's edition is in 2 vols., 4to—*Pharmacopée Royale Galenique et Chymique, par Moyse Charas . . . Nouvelle Edition.* I quote only from the first volume devoted to Galenical remedies.

Take this *Pulvis ad partum difficilem,* powder for difficult labor.

℞ *Testiculorum equi in clibano ex arte siccatorum, cinnamomi acuti, nucleorum dactylorum, boracis, croci et foliorum sabinae siccatorum, ana drachm, ij, Trochiscorum de myrrha, drachm, j. M. fiat pulvis* (5).

Or this *Pulvis hystericus,* hysteric powder.

℞ *Verrucarum ad genua equorum nascentium, verno tempore avulsarum, vel sponte procidentium unc. j. Assae foetidae, cornu et ungulae hirci, ana drachm j. M. fiat pulvis* (6).

A much admired antiepileptic oil is made from the following formula:—

℞ *Rasurae cranii hominis morte violentâ perempti, unc. IV. Succini pulverati, unc. VIII. Misceantur in retortâ vitreâ et distillentur igne arenae* (7).

This oil was given internally three to six drops a day for a month: and also applied externally by anointing the inside of the nostrils, the temples and the parts over the sutures of the skull.

The volatile salt of human blood (8) was also used for epilepsy: as was the volatile salt of human urine (9)—this however, was in addition, "highly esteemed in all obstructions of the liver (10), the spleen and the mesentery . . . lethargy, apoplexy. . . . and convulsions . . . difficulties with the urine and even to dissolve renal and vesical calculus."

The oil of human feces "to which some have given the name *occidental civet*" cures erysipelatous ulcers, cancers and sore throat, topically applied.

Vipers furnished many forms of medicine; we find viper soup made of moderately sized vipers and exenterated chickens, viper oil, viper trochees, viper powders, and viper jelly: and vipers are an ingredient in many prescriptions more or less complicated, e. g., d'Aquin's Theriaca in which I count thirty-six ingredients.

Perhaps the prescriptions for the oil and trochees will suffice:

℞ *Viperas viventes magnas, pingues et vividas, No. xij. Olei Communis purissimi, libr. ij. Vini albi generosi, unc. ij. Extrahe oleum s.a.* (11).

This oil is good for all skin diseases including venereal sores—it also facilitates accouchement, *"si l'on en oint tout le ventre."* The oil of serpents is prepared in the same way, and has the same properties but is not so active (12).

For *Trochisci viperini* this is the formula:

℞ *Truncorum, hepatum et cordium viperinorum, in aëre libero extra solis radios siccatorum, quantum libuerit. Fiant ex arte trochisci* (13).

These are sovereign against poisons, serpent bites and all sorts of venomous animals, useful also in malignant fevers, epidemic maladies, etc.

Lizards also have their uses—oil of lizards for increasing the growth of the hair has no superior:

℞ *Olei expressi nucum juglandium depurati, libr. iij. Vini albi, unc. iij. Lacertas viventes, viridcs et vividas, No. xij. vel xv vel xx pro ratione magnitudinis, &c.* (14).

Fox oil, *oleum vulpinum,* is made of a young fox, skinned, exenterated, cut into small pieces and mixed with olive oil and spring water.

This cures rheumatism, sciatica and the like.

Of scorpon oil there are two kinds, *oleum scorpionum simplex* and *oleum scorpionum compositum:* the former is made from live scorpions, olive oil and generous wine; the latter requires no less than five processes and contains in addition to scorpions "captured in the dog days" and olive oil, the leaves, flowers or roots of some thirty-three plants. No wonder then that it is much esteemed against "all kinds of venom and poison, especially . . . the bites of vipers, asps, and all kind of animals and to preserve from and cure the plague. It is also usefully employed against small pox, measles and all epidemic maladies as well as against epilepsy, paralysis and most of the affections of the brain, but particularly against worms and the poison of monk's hood and other aconites."

For hernia, vulgarly called rupture, a plaster of much excellence could be made of fresh eelskin,

*Read before the Toronto Medical Historical Society.

haematite, sugar of lead, burnt tin, gum ammoniac and oil of myrrh.

But the frog had more virtue. Vigo's plaster of frogs with mercury followed this prescription.

℞ *Ranas viventes, No. xij. Lumbricorum terrestrium purgatorum, unc. iv. Radicum ebuli et enulae campanae, ana unc. ij. Schaenanti, staechaids Arabicae et matricariae, ana manip, j. Aceti fortis, vini austeri, ana libr. ij.*

Then another preparation is made from this formula:

℞ *Lithargyri auri praeparati, libr. ij, Pinguedinis porci et vituli, ana unc. ix. Oleorum camomillae, anethi, liliorum, laurini et de spicâ per infusionem et decoctum paratorum, ana libr. s. Cerae citrinae, libr. j. Axungiae viperinae, unc. iv. Pulveris olibani, unc. iij. Euphorbii, unc. js. Croci unc. s. Mercurii vivi, libr. j. Terebinthinae et styracis liquidae, ana unc. iv. Fiat emplastram* (15).

"This plaster appeases pains of the shoulders, arms, thighs, legs and all the solid parts when they arise from any venereal poison for by strengthening the parts it draws out the poison and converts it into a kind of moisture. It is applied also along the spine and elsewhere to eradicate the venereal poison, to provoke the flow of saliva and resolve the nodes and other tumors which form on the legs and on the various other parts of the body." We are not told what function is performed by the frogs.

Perhaps we cannot finish this paper more fittingly than by giving the formula for *oleum lumbricorum*, oil of worms.

℞ *Lumbricorum terrestrium crassiorum lotorum, Olei communis, ana libr. iij. Vini albi, libr. s. Eliciatur oleum* (16).

You gather your worms, hang them for three days to disgorge the earth they have swallowed, wash them well and dry them with a linen cloth—then proceed *secundum artem.*

This oil is used externally for pains in the joints, dressing wounds and bruises, and for all maladies of the nerves and muscles. (17).

Notes.

1. This is one of the most interesting histories of medicine I know of—not so full or so biographical as Bass' monumental work, it is distinctly more philosophical. My quotations are from pp. 132, 170.

2. Mohammed Ebn Zakarijah Abu Bekr, commonly known as Rhazes, born 850, died probably about 925: he wrote no less than 237 treatises, of which his *Aphorisms* is the best known—he was an admirable surgeon and believed in the Oil of Ants. Ali Ben el Abbas, commonly called Ali Abbas, died about 994—his work was translated into Latin by Constantius Africanus under the title Pantegni (i.e. Pantechnai). Those two did not found, but they followed the Arabian School, Auber's *l'Arabisme.*

3. Charas was born in Languedoc in 1618 and followed his profession as apothecary at Orange and later at Paris. Being a Calvinist, he was forced to leave France in 1680—he went to England, then to Holland, then to Spain to attend Charles II. Disputing the contention of the Court physicians, firmly believed in by the Spanish people of the district, that the vipers for twelve miles around Toledo were harmless ever since they had been deprived of their poison by the fiat of a famous Archbishop, he fell into the hands of the Inquisition whence he escaped only by adjuring his Protestantism. He returned to Paris in 1690, where he lived until his death in 1698.

4. Monnier or Le Monnier or more correctly Lemonnier is known only by this work—he modestly hides his identity under initials, describing himself on the title page as *"M. L. M. de l'Académie Royale des Sciences et Docteur en Médecine de la Faculté de Paris."* The work was published *"avec approbation et privilege du roi,"* the Licence being dated seven years before publication, July 15, 1746. He was not yet Royal Physician. See Alfred Franklin's *La Vie Privée d'Autrefois, Les Médecins,* p 169.

5. Of horse's testicles dried *secundum artem* in an oven, highly flavored cinnamon, date stones, borax, saffron and dried leaves of savin, each, two drachms. Myrrh trochees, one drachm. Mix. Form a pill.

6. Of warts growing on horses' knees, taken off in spring or falling spontaneously, one ounce, asafoetida, horn and hoof of the goat, each, one drachm. Mix. Form a pill.

7. Scrapings of the skull of a man snatched away by a violent death, four ounces; pulverized amber, eight ounces. Mix in a glass retort and distil over a hot sand bath. The author calls the *"ignis arende," "à feu de sable augmenté par degré."* He does not personally favor ustion or calcination of the human skull but admits that several authors approve of this form of preparation.

8. Especially *"l'arriere faix des femmes."*

9. Preferably that of "young people who drink wine."

10. "Obstruction" was a blessed name among physicians like "Mesopotamia" among the devout. The celebrated Arnauld de Villeneuve (Arnoldus de Villanova, ob. 1313), giving his pupils practical instructions, recommended that they should under no circumstances manifest hesitation or astonishment. He said (I translate literally). "The seventh precaution is of general application. Suppose that you are unable to understand anything in the case of your patient, say to him with confidence that he has an obstruction of the liver. If he replies that it is in the head or some other part that he suffers, state boldly and positively that that pain comes from the liver. Take great care to use the term 'obstruction' because patients do not know what it means and it is a matter of great importance that they should not know." See his *Medica Practica,* Venice, 1494. A French writer, Alfred Franklin, in his *La Vie Privée d'Autrefois: Les Médecins,* says that the physicians of Philippe le Bel were not of the school of Villeneuve because it is recorded that that King died of a long sickness of which the cause was unknown to his physicians and was *"pour eux et pour beaucoup d'autres le sujet d'une grande surprise et stupeur"*—the fact being that he had broken his leg hunting in the Forest of Fontainebleau when his horse stumbled, and it is said "the troubles of all kinds to which the King was then a prey joined to the attentions showered on them by his physicians had beyond question rendered the sequelae of that accident, mortal.

11. Twelve large, fat, vigorous, live vipers, two pounds of the purest olive oil, two ounces of rich

white wine. Extract the oil according to the rules of the art (*secundum artem*). We are told that the vipers should be captured toward the end of April or the beginning of May, the heads and tails cut off with scissors, the vipers then skinned and all the internal organs taken out except the liver and heart.

12. Charas and Lemonnier do not seem to have approved broth of serpents, which, as all readers of *Salammbo* will remember, was in use among the Carthaginians as a cure for leprosy—nor the flesh of serpents which was recommended by Celsus for food to the mediaeval Knight, Lancinet, as a cure for the King's Evil, *ecrouelles;* where this failed, the faithful Knight was cured by the touch of King Clovis, the first King of France to have the wondrous gift of healing; but, says the jubilant if credulous writer: *"Téousjours despuis, ceste grace et faculté a esté comme héréditaire aux rois de France."* Alfred Franklin's *La Vie Privée d'Autrefois: Les Médecins,* p. 255.

13. Trunks, livers and hearts of vipers dried in the open air in the shade, q.s. make trochees, *secundum artem.*

14. Expressed walnut oil purified, three pounds; white wine, three ounces; lizards, live, green and vigorous, twelve or fifteen or twenty according to the size, &c. This formula is credited to Mathiole, i.e. Pietro Andrea Mattioli (1501-1577) of Florence, a botanist and physician of some note.

15. Live frogs, twelve; earthworms stripped, four ounces; of roots of dwarf elder and elecampane, each, three ounces; of sweet rush, Arabian lavender and motherwort, each, a handful; of strong vinegar and sour wine, two pounds—then of prepared litharge of gold (i.e. ordinary plumbic oxide, PbO, mixed with red lead) two pounds; of pork and calf fat, each, nine ounces; of the oils of camomile, dill, lilies, laurel and spike, prepared by infusion and decoction, each, half a pound; of yellow wax, one pound; of viper fat, four ounces; of powder of olibanum, three ounces; of euphorbium, half an ounce; of saffron, half an ounce; of mercury, one pound; of turpentine and liquid storax, each four ounces. Make a plaster.

16. Of large well washed earthworms and olive oil, each three pounds; of white wine, half a pound. Extract the oil.

17. While our author gives us a few dentifrices, he does not follow *"beaucoup de personnes qui avaient l'etrange coutume de les (dents) nettoyer avec leur urine."* Not so strange—I have known the custom within fifty years in Ontario among certain Canadians of French descent; and I am assured by one who should know that the custom is prevalent among the country people of Normandy.

Against caries of the teeth we are assured by the surgeon B. Martin, author of a *Dissertation sur les dents,* Paris, 1679, p. 64, there are two remarkable specifics *"l'urine et les crottes de chat sauvage."* It will be remembered that John Wesley recommended dry *zibethum occidentale i.e. stercus humanum* warmed and spread on leather as a plaster for "Windy Rupture," ear wax for specks in the eye and goose droppings with celandine as a plaster for Cancer. See *Wesley's System of Medicine,* New York Medical Journal, January 10, 1914.

Contributors to the Science of Medicine

Ambroise Paré

Ambroise Paré was one of the first great surgeons and the first great army surgeon and, as Linacre in England assisted in raising medicine from the slough into which it had fallen through following too closely Arabian precept and practice, so Paré was largely instrumental in combating the Arabian school of surgery and general treatment. Those who did great things for surgery in the Middle Ages may be counted easily on the fingers of one hand. Constantine of Salerno, Guillaume de Salicetis, Lanfranc, Guy de Chauliac and Ambroise Paré, perhaps, for England, John of Gaddesden and John Aderu. The Arabian School, which dominated the practice of medicine and surgery at the time of Paré in France and Linacre in England, had set tradition and authority above observation and experiment. The church, which in France and England and in the other civilized European countries ruled the physicians, forbade the shedding of blood and surgery was kept at the level of badly organized trade. Paré, Linacre and those of a like mind endeavored to overturn tradition and to return to the pure teaching of Hippocrates and Galen. Paré followed the advice of Guy de Chauliac as closely as possible when he wrote, "Let the surgeon be well educated, skillful, ready and courteous. Let him be bold in those things that are safe, fearful in those that are dangerous; avoiding all evil methods and practices. Let him be tender with the sick, honorable to men of his profession, wise in his predictions; chaste, sober, pitiful, merciful; not covetous or extortionate; but rather let him take his wages in moderation according to his work, and the wealth of his patient, and the issue of the disease and his own worth."

Ambroise Paré was a typical figure in many ways of the time and of his country. He contributed greatly to raising the surgeon's profession from a lowly and despised handicraft to a position equal to that of the other branches of the healing art. Paré was essentially an army surgeon, he could hardly escape from being this in the stormy times in which he lived and learned his surgery in the rough and ready school of war. In the year of his birth, 1510, Louis XII was king of France, Maximillian was Emperor, Henry VIII was king of England. During his life the crown of France passed from Louis XII to

Francis I, then to Henry II, then to his three sons in succession, Francis II, Charles IX, and Henry III, and then to Henry III.

In England Edward VI succeeded to his father's throne, then Mary, then Elizabeth. The empire passed from Maximillian to Charles V, and afterwards to Philip of Spain.

During the whole of this time France was at war. Calais was taken from England when Paré was forty-eight. However, the fighting between France and England was nothing to him in comparison with the wars against Germany, Italy and Spain. Other nations were involved, Switzerland and the Netherlands. The King of France in 1548 allied himself with the Sultan Suleiman of Turkey. Italy was invaded several times. The chief enemy against whom he served was the Emperor Charles V, and his son, Philip, of Spain, with their German and Spanish armies and their Italian and English auxiliary forces.

Paré, too, saw civil war when in 1562 France was divided against herself, Catholic against Huguenot.

He lived to be eighty years of age, but the times grew worse as he grew older. At the time of his death things had somewhat bettered. His was a very long life.

Among his contemporaries were Ignatius Loyola, Luther and Erasmus, Calvin and Knox, Shakespeare and Rabelais, Raphael and Titian, Paracelsus, Sirvetus, Sylvius, Vesalius and Linacre. Palissy, the potter, was born in the same year as Paré and the two old men were both in Paris as late as 1559, Paré in his home and Palissy in the Bastile. Paris was besieged by Henry IV in the summer of 1589, the siege was raised on August 29th; Paré died before the end of the year.

AMBROISE PARE

From the original picture in L'Ecole de Médecine, at Paris.

"On Thursday, December the twentieth, the eve of St. Thomas, at Paris in his own house, died Master Ambroise Paré, the king's surgeon, eighty years old, a learned man and chief of all surgeons; who even against the times, all his life talked and spoke openly for peace and for the people; which made him as much beloved by the good as he was begrudged and hated by the wicked."

Ambroise Paré was born in the country in the year 1510. His father was either a worker in wood or a valet and barber. Ambroise had a sister, Catherine, who married a master barber surgeon of Paris; a brother, Jehan, who was a master barber surgeon in Brittany and another who followed his father's trade of chest maker. Little is known of Paré's boyhood except that he never learned Greek or Latin and that he was at Angers when he was fifteen years old. He was apprenticed to a barber surgeon. When he was twenty years of age he was in Paris where the plague was raging. He was given a resident appointment at the Hotel Dieu before he had qualified. Dubois Sylvius was one of his teachers. Andreas Vesalius just missed by a year or two being at the Hotel Dieu with him. Vesalius was born in Brussels, and had been educated at the University of Brussels before he came to Paris to study medicine. He was about three years older than Paré and they both had Sylvius for their teacher. The story that they were opposed in the wars, Paré with the army of the King of France, Vesalius with that of the Emperor, is not probable. Paré's first taste of war was in 1537; and in that year Vesalius was already professor of anatomy at Padua. Probably they met over the deathbed of Henry II in 1559.

It is certain that Paré got plenty of work out of the hospital. He had the charge of patients, the privilege of making dissections and postmortem examinations. In one winter he operated in four cases of loss of nose from frost bite; he witnessed the terrors of the plague; indeed, he wrote a book on it, and took part in the whole practice, outpatient and inpatient, of the hospital.

In the year 1537 he was appointed surgeon to the Marechal de Montéjan, colonel general of the French infantry, who were marching under the Constable de Montmorency, to recover Piedmont and Savoy for Francis I from the forces of the Emperor Charles V. It should be understood that at that time there was no organized army medical service. The king took with him his own physicians, who were priests. The seigneurs had their own physicians, priests or clerks in holy orders, who also served as chaplains to the army. A host of barber surgeons and irregular practitioners and quacks of all kinds followed the troops with drugs and ointments and Arabian remedies, women skilled in sucking and dressing wounds went in and out of the camp, while the soldiers, of course, had their own rough and ready methods.

Paré then had no recognized position in the army, no rank in the camp. However, after the first battle he found his hands full with work for which he was wholly unprepared. At first like the other surgeons he followed the rule of Vigo and treated all gunshot wounds with boiling oil. The theory then was that gunshot wounds were poisoned and the boiling oil was considered necessary to drive out the poison. One evening, his supplies of oil having run out, he was compelled to treat his patients without it. The next morning he was astonished to find that every man whose wounds had been treated with a salve only had passed a comfortable night; while all those who had undergone the customary treatment were in fever and great pain. Paré never used boiling oil again.

When his patron, Montejan, died in 1538 Paré returned to Paris and continued his studies and in 1541 was admitted a Master Barber. In the same year Paré married and barely twelve months after was off to the wars again, this time in the service of M. de Rohan. Paré's field surgery was again very successful.

During the intervals of his campaigns Paré practised as an ordinary barber surgeon in Paris. Stimulated by the encouragement of his old teacher Sylvius, Paré published in 1545 the first contribution to surgical literature on gunshot wounds, and also became prosector to Sylvius. In 1550 he published a short book on anatomy and in 1552 a second enlarged edition of his work on gunshot wounds, with much additional material on bruises, burns and gangrenes. Paré was beginning to make for himself a great name. His next chief was the Duc de Vendome, King of Navarre, who, on his return to Paris after a victorious campaign, presented Paré to Henry II, who appointed him one of his surgeons.

War again broke out and Paré was dispatched to Marshal St. André at Verdun and eventually was captured by the enemy and as a reward for his successful treatment of a distinguished enemy general was accorded his liberty. At this time Paré, who had now become, perhaps, the best known surgeon in France, was promoted from the status of "Master Barber Surgeon" to that of "Sworn Master Surgeon of the Brotherhood of St. Cosmas." The succeeding years were filled for Paré with the practice of the profession and with voluminous writings. He was appointed surgeon to the successive occupants of the French throne. Between 1560 and his death in 1590 Paré published or republished twelve volumes.

Among other surgical procedures concerning which he wrote was that of cutting for stone and the surgery of the urinary and genital organs. He wrote a book on gout and another on poisons and bites. As said before, he wrote on the plague and in fact there were few subjects in connection with surgery or even medicine that he did not discuss in writing. Paré was not, perhaps, an original genius, but he was the embodiment of that insatiable curiosity with regard to his own science which has distinguished all great pioneers and reformers. His great contributions to surgery were his discovery that the best treatment for gunshot wounds was not boiling oil but rather soothing applications.

The doctrine that hemorrhage after amputations should not be arrested by the terrible cautery but by simple ligature, and lastly his advocacy of the method now known as podalic version of the babe before delivery in cases of abnormal presentation.

His efforts were always exerted to overthrow the long standing Arabian domination of medicine and surgery and to assist in the return to methods advocated by Aristotle, Hippocrates and Galen. He raised the position of surgeons immeasurably and by his example and precept was a beacon light to the surgeons of his day and succeeding generations. Stephen Paget in *Ambroise Paré and His Times* suggests that in his methods of work Paré resembled in some ways John Hunter. They both of them began life in the country; they saw war and wrote on gunshot wounds; they spent money lavishly when it came; they were both great lovers of animals and their ways. Paré like Hunter loved the collecting of specimens, dissecting them and demonstrating them, although Hunter's magnificent collection is far beyond anything that Paré dreamed of. Yet Paré was diligent at the same work; his house was full of curiosities of natural history and surgery. He gets a rare specimen of disease and calls together sixteen physicians and surgeons to see him dissect it. He gets a dead ostrich and makes a skeleton of it. He keeps the bullets he has removed and shows odd specimens at Court. But there were two points of special likeness between these two great men, their extreme inquisitiveness. They were not satisfied until they had got at the root of a question as far as they were able. They constantly appealed to experiment, questioned, compared notes, getting to learn the results obtained by other men. Paré carried out Hunter's dictum, "Don't think, try."

Paré's influence on surgery was really remarkable. During his lifetime many of the Italian and French great surgeons and physicians adopted his views concerning the nonpoisonous nature of gunshot wounds and revised their mode of treatment accordingly.

Perhaps the greatest of all his contributions to medicine, points out Mrs. Singer in her recent work on Paré, was the service of his own winning personality, the example of his steadfast efforts to increase his knowledge of human anatomy and his skill in the surgical art, and his constant emphasis on the surgeon's duty to exert his utmost efforts to avoid or relieve the patient's sufferings. He was a man of infinite humanity; one of the last and greatest acts of his life was to denounce to his face the Archbishop of Lyons for the harsh measures he recommended for the starving populace of Paris during its siege by Henry IV. To him might be aptly applied the sketch of ideal medical man as conceived by Robert Louis Stevenson, "Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a hundred embarrassments; and what are more important Heraclean cheerfulness and courage. So it is that he brings air and cheer in the sickroom, and often enough, though not so often as he wishes, brings healing."

Sunlight Therapy.—In or before the eighth century B. C., says Dr. C. W. Saleeby in *Sunlight and Health*, Zarathustra, foremost among sun worshippers, taught the cult of the sun and the green leaf and thrift, in place of pillage and murder. In the beginning of medicine, Hippocrates, practising at Cos, in the Temple of Æsculapius, son of Phoebus Apollo, god of the sun and music, practised the sun cure. In the beginning of our era, Galen and Celsus used the sun.

In 1893, says Dr. Saleeby, Niels Finsen began to cure lupus by the local use of sunlight, and Sir James Crichton-Browne made observations to the same effect in England. In 1900, on May 1st, the London Hospital began the cure of lupus by the local use of sunlight, thanks to Queen Alexandra who was instrumental in bringing her young fellow countryman's idea from Copenhagen.

Editorial Articles

THE DISTRIBUTION OF DOCTORS

The General Education Board has just published a report of a study of the distribution of the physicians in the United States made by Lewis Mayers and Leonard V. Harrison. The study was inspired by the occasional cry that goes up of a scarcity of physicians in rural communities. As mentioned in these pages, this state of affairs is oftentimes more in the nature of a theory than a fact, and the cry for a doctor is not infrequently made by a few persons who are disgruntled with, or have not paid the bills of, the physician who is on the spot. Sometimes the call for a doctor comes from some family from the city who finds the resident practitioner not quite sufficiently polished to suit the new resident, though from the very nature of country practice (which is an education in itself) he may be much more capable than the average doctor in the city from whence the new resident comes. The very fact that a doctor practises in a larger place lends a halo of efficiency to his actual capacity.

The report says: "There are today undoubtedly some hundreds of such villages without a physician. The apparent reason, in nearly every case, for the failure of the village to attract a physician, the reason indeed, in many cases, for its having lost the physician it once had, is that despite its being the natural centre of an area populous enough to give wholly adequate support to a physician, a physician locating there could not be certain of even a bare living; a substantial portion of the medical work of the area, and a still more substantial portion of the income, goes to the more distant yet wholly convenient town (in not a few cases, as already suggested, the physician who formerly practised in the village is now located at the adjacent town and his hold on his former territory is likely to be especially tenacious); so that a practitioner in the village would find his income hardy less precarious, and his professional position much less satisfactory, than the village practitioner located in a much poorer, but more remote, area. There exist the apparent need and the apparent ability to support; but the two are not correlated in such a way as to yield any assurance that the individual practitioner who attempts to meet the need will receive the support."

"Summarizing, it appears that a substantial proportion of villages said to be in need of a physician cannot, under the régime of modern transportation, be considered as the logical exclusive centre of an area sufficiently large to utilize the entire time of a physician, and are situated in territory which is already covered from surrounding villages. A small number of remote areas sparsely settled but populous enough to require the entire time of a physician have not, owing to extreme poverty combined with extremely unattractive conditions, a resident physician but must depend for medical service on towns unduly remote, whose physicians are already fully occupied nearer home. A considerable number of rural areas fairly remote from a town, and of the prosperous kind, but well above the pauper level of the areas just referred to, appear to have an unduly low proportion of physicians to population, but are wanting in any particular village, now without a physician, in which a physician locating would have a reasonable assurance of earning a good living. Finally, there is a considerable number of villages in the more prosperous rural areas, now without physicians, which though located within accessible distance of a larger town, are logical and desirable locations for a physician, provided he could be assured of the patronage of the people for whom the village forms the natural centre.

"Our review of the situation has thus led us to the conclusion that only in comparatively few cases do the vacant locations apparently in need of a physician offer any reasonable assurance of a livelihood obtainable within a reasonable time; and that in the cases where such assurance is possibly present, the livelihood obtainable is frequently too meager to offset the extreme conditions of isolation and hardships found in those areas."

That a community of five hundred people could easily furnish a living to a physician is evidenced by the fact that if each paid him two cents a day (less than will be spent for candy and cigars) he would have an income of $3,500. If this amount were paid as a bonus or for annual health examinations, he might do very well indeed with moderate extra fees for sickness and childbirth. We are quite willing to pay out more money for useless or harmful luxuries than for the preservation of, or even restoration to, health.

The report finds that the essential cause of migration of physicians to larger centres is chiefly the superior social advantages and to escape the hard physical work of long drives over bad roads.

In the cities the general population cannot afford to be sick and, in the rural regions, it looks as if they would be compelled to obey the laws of health.

The report ends with the following paragraph:

"If the conclusions reached in the present chapter are sound, no reduction of medical school require-

ments, either for entrance or graduation, that is at all within the realm of possibility, would be likely to have a significant effect upon the future supply of physicians to the rural areas; and the creation of a substandard class of physicians for those areas is quite impracticable. Whatever may be thought, therefore, of the necessity for taking measures to meet the problem of rural medical service, it seems clear that the situation does not call for any present action in the field of medical education in the direction of a reduction in requirements or a lowering of standards."

THE SECRET OF CARIES

It looks as if the causes of dental caries were near being discovered, and, with it, the means of partial or total prevention. If it comes to pass that this most common of diseases can be greatly reduced, there will be an enormous saving in cash as well as improvement in health, for our dental bills run somewhere in the hundred millions, although a large percentage of carious teeth go uncared for and rot away until they fall out or are removed because of pain.

Dr. May Mellanby has done a fine piece of work in the study of the effects of foods on the dental conditions of dogs, and she found that both the structure and arrangement of teeth in puppies depend on their diet and environment during the period of tooth development. Some foods help, some hinder, dental development. Materials to be found in codliver oil, animal fats (except lard), milk and yolk of egg are especially useful, while the feeding of cereals, especially oatmeal, leads to badly formed teeth peculiarly subject to caries.

Exposure to either sunlight or to ultraviolet rays "has, under some conditions, an important influence on tooth formation . . . probably by making active the calcifying vitamine stored in the body. . . . In fact, the interaction of dietetic and environmental influences on teeth formation is certainly very close."

Dr. Mellanby finds that "teeth may be well formed and yet be likely to become carious" though, on the whole, well formed teeth are the least carious. In well formed but carious teeth the secondary dentine present was usually found to be poorly calcified, while in badly formed teeth, free from caries, or in which caries had been arrested, there was generally some well formed secondary dentine.

Mellanby, Pattison, and Proud are carrying out some experiments on the effects of these various conditions on children, in a London hospital and, considering the length of the experiment, their findings are most interesting. Three groups of children were used, all of them between seven and seven and a half years of age. One group was placed on a diet which included codliver oil, from two to one and a half pints of milk, and eggs, but no oatmeal. The second group were given a similar diet, though with little milk, little egg, no codliver oil, but with oatmeal. The third group had the regular hospital diet. All had fruit, potato, and other vegetables, meat, bread, rice and sugar. The first group received butter; the others, oleomargarine. The average number of carious teeth for the groups at the beginning was 6.5, 6.125 and 7. The average increase of old caries was .75, 2.3 and 1.4. The average new teeth becoming carious was .65, 2.8 and 1.54. The average new and increase of old caries was 1, 5.1 and 2.9.

It would be most instructive if the experimenters could continue this experiment on the same groups of children by changing their diets, and reversing that of the first and second.

SYPHILIS OF THE THYROID GLAND.

As pointed out by Dr. Guillaume in his article which appears in this issue, syphilis of the thyroid is a rare affection. The secondary manifestations—specific thyroiditis—may terminate in exophthalmic goitre, as Schulmann has shown (Medical Journal and Record, September 17, 1924). Pathologically, tertiary thyroiditis presents itself in one of three types, namely, the gummatous, sclerogummatous, and sclerous. In the sclerogummatous type, lesions of the trachea are always present, and would appear to indicate a primary specific localization in the trachea and larynx, finally ending in a cervical cellulitis which surrounds and secondarily compresses the thyroid, but this point is not as yet perfectly clear and further study is necessary.

Histologically, none of the elements described—round cell infiltration, sclerosis, gummata, epithelioid nodules, giant cells, and vascular changes—can be regarded as specific. These lesions are quite likely to be mistaken for tuberculosis or certain types of sarcoma. Clinically, the circumscribed gummatous type simulates nuclear goitre and cyst of the thyroid, while the sclerogummatous and ligniform types are quite identical with cancer and Riedel's disease. The sclerous type is quite impossible to diagnose clinically, but the nature of the gummatous form may be suspected by the hardness and irregularity of the tumor and its sensitiveness to deep palpation. Hence, in practice, when in the presence of a thyroid neoplasm, it is absolutely essential to search for syphilitic lesions in the patient's antecedents and resort to the Bordet-Wassermann test. If one is still in doubt, a test treatment should be essayed.

The prognosis of the gummatous form is good.

In the sclerogummatous and ligniform types the lesions of the larynx and trachea dominate the evolution of the process and may cause sudden death, hence the necessity of laryngoscopic examination.

As to treatment, potassium iodide, mercury, and arsenic will cause the tumor rapidly to disappear. In the sclerogummatous and ligniform types with lesions of the trachea and larynx a combined mercury and arsenic treatment is indicated, and will avoid the necessity of a useless surgical interference. But should asphyxia be imminent, palliative tracheotomy must naturally be done.

INTRACRANIAL ABSCESSES

Intracranial abscesses may be either extradural or intradural; the former develop between the skull and dura, the latter in the cerebral substance. Meningeal abscesses are exceptional. Intracranial abscesses, excepting those of traumatic origin, occasionally result from suppurating processes in the sinuses, but in the immense majority of cases they follow some otic infection, and in spite of their relative frequency they are generally unrecognized. Undoubtedly this is due to the fact that they are seated in the temporosphenoidal lobe or the external aspect of the cerebellum, these areas giving rise to relatively few symptoms and regardless of rather extensive destructive lesions sometimes observed, their symptomatology is latent.

A brain abscess when fully developed and up to the appearance of coma is an ambulatory affection. The loss of consciousness often appears to be the initial symptoms of the process, but in reality such is not the case because a diagnosis can be made earlier in the evolution of the disease. There are two symptoms which from their permanence and constancy are undeniable signs of an intracranial abscess, especially the most serious form, namely, an intracerebral abscess. These signs are almost pathognomonic and may be met with singly or combined with the following symptoms, viz., a slow pulse, hypothermy, vomiting, papillary stasis, pain on pressure, and localizing signs, but the latter are uncommon.

The two pathognomonic symptoms are headache and intellectual dullness with psychic depression; at an advanced phase of the process somnolence, stupor, etc. Hence it is the initial symptoms that are to be searched for in order to act both usefully and without delay, before the patient is bedridden and the major cerebral lesions appear. All the other signs that have been described—and they are numerous—are of secondary importance.

It is true that headache and intellectual dullness also are met with in aseptic hypertensive meningitis but in these circumstances they are much more ac centuated, the patient complaining of violent pai in the head and other symptoms. A patient wit abscess refers indifferently to pain; he is in a stat of torpor from which he is with difficulty arouse and then he will be quite indifferent regarding hi condition.

As to the usual classical signs of brain abscess an their diagnostic value it can be said that hypotherm is met with when the pus is encysted, while ther is a rise of temperature when diffuse encephalitis o an inflammatory reactional meningitis exists. Papil lary stasis is the result of a superadded meningea reaction, but a slow pulse is more important and i not infrequent. To possess all its value the follow ing conditions must be realized, namely, drainage o the bone lesions and absence of septic absorption an inflammatory meningeal reaction. For that matter during the evolution of a brain abscess there may b hypothermy or fever, a slow or rapid pulse, and ever dissociation of the pulse and temperature. Moto symptoms are unusual. Hence the two most im portant symptoms of brain abscess—because they are constant and occur early in the evolution of th process—are headache and intellectual dullness wit a change of character.

MUSIC AS A MEDICINE

A poet once said that music hath charms t soothe the savage breast and the soothing influence of music has been referred to by distinguished writers on many occasions. Recently, more than one writer has urged that music under certain conditions exerts definite remedial powers. Not long ago a British writer extolled the healing effects of music both on the body and mind diseased and now under the aegis of the American National Bureau for the Advancement of Music Mr. Willem van de Wall has published a book, *The Utilization of Music in Prisons and Mental Hospitals.*

Mr. van de Wall, who was at one time harpist in the orchestra of the Metropolitan Opera, has had much experience as a student of mental cases. It may be interpolated that the most celebrated instance from history of mental aberration being overcome by music is that of King Saul, who was charmed into a normal state by the playing on the harp by David. Indeed, in old times when it was the current belief that insanity signified that the person afflicted was possessed of an evil spirit, it was also the belief that music sometimes had the power of driving out the evil spirit. Mr. van de Wall seems to show in his book that great benefit may be derived from music by those mentally unbalanced and even in cases which have appeared incurable.

He does not claim so much for music in itself but recognizes that its chief good generally comes from the fact that it takes the patient out of himself and discourages brooding and introspection, the main banes of one demented. Mr. van de Wall states that in his opinion "music is the most efficient general disciplinarian and moral agent in prison management, effecting at once that for which modern, humane and sensible imprisonment is intended, namely, the change of bad feelings into good, the doing of friendly deeds rather than evil, the substitution of constructive habits for destructive." If it be granted that the criminal is a criminal because he is possessed of an abnormal mind and that music will do much for his moral regeneration, and that music exercises distinct therapeutic effects on those of obviously unbalanced minds, what may not music do in preventing mental and moral aberrations.

Mr. van de Wall holds that music may exert an excellently beneficial preventive action. In fact, he insists that in certain circumstances music may be either preventive or curative. There may be exerted and doubtless is exerted by music a good mental and moral influence and provided that many of the occupants of an institution for the insane are not musicians themselves, the effects of music may be remedial. But unless the music is of a high standard it is not unlikely that really musical inmates may be driven to an acute and violent stage of madness rather than soothed and taken out of themselves by the entertainment provided for them.

An inmate who knows little or nothing of music is more likely to be favorably influenced by a band as described by Mr. van de Wall consisting among other instruments of six trombones, ten saxophones and just a bunch of clarinets and cornets, than one whose ear is attuned to sweet musical sounds by experience and perhaps by heredity. Is music then preventive of an unhinged mind, and is it essentially a harmonizer?

The history of the lives of great composers, players and singers seems to be opposed to such a statement. As a rule, musicians themselves and those who have to do with music are not remarkable for their suavity, urbanity, or are not conspicuous for their personal and social virtues. If the tales told of them be true or partly so, they are in the main by no means a harmonious company but stand out from the ordinary individuals who comprise the community as especially selfcentred, vain, selfwilled and jealous. Again as a preventive measure music would be most difficult, indeed impossible, to prescribe. To whom or to which class should this unenviable task be delegated?

So far as music as a preventive measure is concerned it may be concluded that its practical application is not feasible. As a remedial measure in some conditions it has its good points. In a State institution, the inmates can be controlled and "the proper application of music" may be followed by satisfactory results.

Music may be likened in some respects to food—"what's one man's meat is another man's poison." The Scotchman has a partiality for coarse oatmeal, haggis and the bagpipes, while such harsh food and music would be displeasing to most Italians. However, there is truth no doubt in the assertion that music has often a favorable influence on morals and mind and certainly stirs the emotions and deters for a time, at any rate, introspection.

THE ADVANCEMENT OF SCIENCE

"It is a wonderful thing," said President Coolidge in his address before the American Association for the Advancement of Science at its recent meeting in Washington, "to live in a time when the search for truth is the foremost interest of the race. It has taken endless ages to create in men the courage that will accept the truth simply because it is the truth. Ours is a generation of pioneers in this new faith. Not many of us are endowed with the kind of mental equipment that can employ the scientific method in seeking for the truth. But we have advanced so far that we do not fear the results of that process. We need truth; and we turn to you men of science and of faith, eager to give you all encouragement in your quest for it." In this statement President Coolidge doubtless voices the belief of most of the thinking minds of this country, with all due respect to the truth of the fact that science in the hands of the evil or unscrupulous may become not only a menace but a real danger. Yet this is a risk that is always coincident with progress, and is perhaps today no greater than in former times.

The annual meeting of the American Association for the Advancement of Science was marked by an unusual number of significant papers and addresses. Among these was the report on mercurochrome, the general antiseptic against most forms of bacteria, by Dr. Hugh P. Young, of Johns Hopkins University. Mercurochrome was produced at the Brady Urological Institute, and is administered intravenously and otherwise. Dr. Young predicted that this drug will doubtless bring about the greatest conquest of disease in the history of medicine. In the investigation 265 different chemical combinations were worked out and studied for their effects. Mercurochrome was found to be the most efficacious in its germicidal properties as well as in its lack of harmful sequelæ. The drug has been used successfully in treating septicemia, advanced pneumonia and

many kinds of focal infections, and has been tried in the treatment of many other kinds of acute and chronic infections and infectious diseases.

Among other significant papers was that of Dr. Morton C. Kahn, of Cornell University Medical School, in which he described the findings of the Bacillus welchii, an organism discovered by Dr. Welch of Johns Hopkins, in the intestinal tracts of patients suffering from pernicious anemia, and the possibility of their being a causative factor in the disease. Dr. William A. Noyes, who has recently returned from an extended European tour, read a paper on European laboratories in which he emphasized the great work being done there in spite of depreciated currencies and high costs of living consequent upon the war. Dr. George Sarton, of the Carnegie Institution, presented a paper on medieval science to the history of medicine section of the meeting.

PSYCHOLOGICAL TESTING

The greatest impetus that has ever been given to mental or psychological testing came through the world war. After discussing the origins and principles of mental testing, and outlining the Army tests, Helen B. Dolan, of the United States Public Health Service, writes in a recent number of *Public Health Reports* about developments since that period. It was during the war that the alpha and beta tests were organized and successfully applied. Up to the close of the war work had been done along lines of testing general intelligence only, but with the development of the Army tests, many new possibilities were opened up, and psychologists enthusiastically undertook to broaden the field and extend its limits. Trade tests and tests rating special abilities were organized, the number and kinds of intelligence tests were increased, and finally attempts have been made to measure temperamental characteristics. None of these latter tests, however, have been standardized, and so cannot be rated as giving a definite measurement of the trait under consideration. Many of them take the form of single trait measurements, such as aggressiveness, social relations, selfassurance, speed in the ability to make decisions, and creative imagination. The Downey will temperament test, while still questionable, for various reasons, as to its results, represents an attempt to obtain an appraisal of temperamental qualities. It comprises twelve tests, each measuring a certain personal characteristic of the individual being tested. Through this test, individuals may be classified roughly in three types: the explosive; the willful, aggressive; and the slow, accurate, tenacious types. It has been considered that a high total score tends to indicate a strong personality. The tests for creative imagination, esthetic judgment, and moral concepts are still so elementary and lacking in scope that they seem hardly practicable or significant in their results.

In foreign countries, interest in psychological testing seems not to be so widespread as in the United States, although France has given considerable attention to vocational guidance for exsoldiers. In that country also American methods of industrial management are beginning to be used. England is interested in job analysis and is attempting to ameliorate industrial conditions through vocational guidance. Germany has a national association for vocational guidance, and in some of the cities occupational tests are given in factories and intelligence tests to school children. The article states, however, that these are poorly administered. In China the first attempt to introduce scientific intelligence tests was made in 1920 by two Chinese psychologists who had been educated in America. The fact that so many of the Chinese are illiterate made these tests applicable to very few, so efforts are being directed to devising nonverbal tests for use there.

The process of developing mental tests has laid stress upon the quantity of the tests at the expense of their quality. As a result, the real problems of securing accurate measurements were not realized until analyses were made of the quality and reliability of the tests already in existence.

News Items.

Tropical Disease Study.—The United Fruit Company offers a limited number of passes for properly accredited scientific investigators who wish to work at the Barro Colorado Island Research Laboratory, in Panama. Applications for passes should be addressed to Thomas Barbour, Ph.D., in care of the National Research Council, Washington, D. C., or to the Museum of Comparative Zoology, Cambridge, Mass.

Personal.—Dr. Robert A. Lambert, professor of medicine at the Sao Paulo Medical School, Brazil, and connected with the Rockefeller Foundation, has returned to this country.

Dr. Arnold Messing has received an appointment as adjunct assistant surgeon to Gouverneur Hospital, New York.

Dr. J. M. Gershberg, who has been abroad for fourteen years, is to resume his practice in New York.

Dr. Luis P. Berne has received an appointment as consulting plastic surgeon for the Rockaway Beach Hospital.

Dr. Wendell C. Philips, who is retiring from active service at the Manhattan Eye, Ear, and Throat Hospital, will be the guest of honor at a dinner given on February 7th, by present and former members of the staff.

Dr. Frank Billings, of Chicago, has been elected an honorary member of the American Stomatological Society.

Dr. George Draper, of New York, spoke on the "Relation of the Human Constitution to Disease," and Dr. Alfred F. Hess, on "Recent Advances in the Biological Effects of the Ultraviolet Rays," at the meeting of the medical section of the American Association for the Advancement of Science held in Washington during the week of December 29th.

Dr. Cornelius G. Coakley, of New York, has sailed for France, to deliver a course of lectures before the International Postgraduate School at the St. Louis Hospital, Paris.

Canadian Social Hygiene Association.—A grant of fifteen thousand dollars from the Metropolitan Life Insurance Company has been made to the Canadian Social Hygiene Association, for aid in extending its child welfare and educational activities.

New Medical Centre.—Ceremonies connected with breaking ground for the new medical centre of Columbia University and the Presbyterian Hospital were held Saturday afternoon, January 31st, with General William Barclay Parsons, chairman of the joint administrative board, as presiding officer. Addresses were made by Nicholas Murray Butler, Dr. C. Floyd Haviland, Mr. Dean Sage, and the ground was broken by Mr. Edward S. Harkness, first chairman of the board.

Tryparsamide to Be Placed on Sale.—The Rockefeller Institute for Medical Research has announced the release of the drug known as tryparsamide for use in the treatment of human and animal trypanosomiasis (African sleeping sickness and *mal de caderas*) and selected cases of syphilis of the central nervous system. This action is based on results reported from clinical investigations which have been in progress for several years. In releasing the drug for the benefit of the public, the Rockefeller Institute desires it to be known that the institute does not share in any way in profits that may be derived from the sale of the drug, and that, with the cordial cooperation of the manufacturers, provision has been made for the maintenance of a schedule of prices on as low a basis as possible.

Benefit for Needy Physicians.—The Association for the Relief of Needy Physicians of Central and Eastern Europe, is asranging a benefit performance of "Artists and Models," on Monday evening, February 9th, at the Astor Theatre, Broadway and Thirty-ninth Street. Contrary to popular belief that with the adoption of the Dawes Plan and the stabilization of the mark, conditions are such that no further help is need, many of the older physicians, men whose names are world famous, are still facing actual starvation. Even more deplorable are the conditions of the windows and orphans of physicians; the aged daughter of Prof. Rudolf Virchow has become a charity ward of the city of Berlin. Medical men of Germany have raised the sum of 300,000 gold marks for the widows of their colleagues, in spite of the fact that a busy physician earns about sixty-five marks a month, or a little over $15 in American currency.

International Congress of Radiology.—It has been suggested that an International Congress of Radiology be held in London in the summer of 1925. The date proposed for the opening is Tuesday, June 30th, the congress to occupy four days of two sessions each, with subsequent visits to provincial centres. The house of the British Institute of Radiology will be used as an administrative and social centre for the Congress. It is hoped that an International Committee will be formed by a number of leading radiologists throughout the world and that the congress will serve to initiate at the institute a permanent nucleus for international collaboration on radiology and kindred subjects. The provisional committee charged with the preliminary arrangements will meet in London early in September, when it is hoped that it will be possible to draw up a definite program and fix the date.

All communications should be addressed to The Secretary, International Congress of Radiology, c/o The British Institute of Radiology, 32 Welbeck Street, London, W.1.

Hospital News.—St. Francis Hospital, New York, is building a forty-room nurses' home. The Newark City Hospital is building a convalescent hospital on a hundred acres of vacant land near the Newark City Almshouse.

The New York Association for the Blind is planning a new building, to cost $250,000, on the site of its present Lighthouse, and on the next lot on Fifty-ninth Street.

The Brooklyn Nursery and Infants' Hospital has completed a campaign for raising $45,000 as an emergency fund.

The Flower Hospital, of New York, makes an announcement of special courses in blood transfusion and blood perfusion, under Dr. A. L. Soresi, director of surgical research. Indigent patients will be treated Wednesdays for blood transfusion or perfusion, and on Thursdays for empyema.

The Massachusetts General Hospital announces that its surgical services will be reduced from three to two. Dr. Daniel F. Jones and Dr. Edward P. Richardson will serve as chief, with Dr. Charles A. Porter as surgeon in chief of both services.

Books for the Blind.—The Permanent Blind Relief War Fund, 730 Fifth Avenue, New York, announces several English books in Braille, and between forty and fifty French titles. These are for distribution to libraries with departments for the blind, requests for the war blind being given preference.

Public Health Expenditures.—The Conference of State and Provincial Health Authorities of North America has tabulated expenditures for public health administration work. New York State stands eleventh in the list, spending 14.0 cents per capita. Heading the list is Delaware, with an expenditure of 39.2 cents, and Massachusetts comes next, with 27.9 cents, followed by Pennsylvania, with 25.9 cents.

New Hospital for Indiana University.—Mr. and Mrs. William H. Coleman, of Indianapolis, have given $250,000 to Indiana University for a woman's hospital, principally maternity cases, to be located on the medical school campus, and to serve as a training unit for the school of medicine. The hospital is a memorial to their daughter, Suemma Coleman Atkins. There will be accommodations for about one hundred patients.

Society News.—The Mercer County Medical Society, at a meeting at Trenton, New Jersey elected the following officers: Dr. Daniel L. Haggerty, president; Dr. John B. Comfort, vice-president; Dr. Alfred D. Hutchinson, secretary, and Dr. Harry R. North, treasurer.

A conference on tuberculosis was held in Pittsburgh January 20th and 21st, under the auspices of the Pennsylvania Tuberculosis Society, marking the thirty-third annual meeting of the society.

Caduceus Post, No. 818, American Legion, composed of some five hundred medical officers of the world war, has elected the following officers: Commander, Dr. Graeme M. Hammond; first vice-commander, Dr. Jay D. Whitham; second vice-commander, Dr. Herbert L. Wheeler; third vice-commander, Col. F. F. Reynolds; adjutant and treasurer, Mr. Robert R. Gerstner.

The Medical Officers' Association of the U. S. Veterans' Bureau, New York City Office, has elected the following officers: President, Dr. Emil Boehm; vice-president, Dr. G. C. Colyer; secretary-treasurer, Dr. Charles R. Brooke.

The New York Physicians' Association has elected the following officers: President, Dr. Jacob Braun; first vice-president, Dr. Leopold Marcus; second vice-president, Dr. Joseph Ziporkes; treasurer, Dr. Aaron Brown; secretary, Dr. James W. Smith; recording secretary, Dr. Max Soletsky; trustees, Dr. Arnold Sturmdorf, Dr. Arthur E. Hoag and Dr. Alfred E. Hellmann.

The American Laryngological, Rhinological and Otological Society has completed arrangements for its 1925 convention which it will hold at The Ambassador Hotel, Atlantic City, May 22nd to 25th. The American Proctologic Society and the Association for the Study of Internal Secretion will also meet at that hotel directly following.

The Riverside Medical Society of the City of New York elected the following officers for 1925 at its recent meeting: Dr. Isador Kahn, president; Dr. Michael Schuman, vice-president; Dr. Samuel Morse, secretary; Dr. Louis Lewis, treasurer.

At a meeting of the Metropolitan Medical Society, held December 23d, the following men were elected to office for the ensuing year: President, Dr. Louis Carp; vice-president, Dr. Joseph Felsen; treasurer, Dr. Morris Grossman; recording secretary, Dr. Theodor Blum; corresponding secretary, Dr. I. Morton Brenner; executive committee member, Dr. S. Philip Goodhart.

The Indiana State Medical Association has elected the following officers: Dr. Eldridge M. Shanklin, Hammond, president; Dr. Charles G. Beall, Fort Wayne, Dr. John H. Hare, Evansville, and Dr. Melville F. Johnston, Richmond, vice-presidents; Dr. Charles N. Combs, Terre Haute, secretary-treasurer; and Dr. Joseph Rilus Eastman, Indianapolis, as delegate, and Dr. David Ross, Indiapapolis, as alternate delegate to the American Medical Association.

The Maine Public Health Association has elected the following officers: Mr. Henry Richards, Gardiner, president; Dr. Elmer D. Merrill, Dover-Foxcroft, honorary president; Dr. Bertram K. Brayant, Bangor, vice-president; Mrs. Sarah Rideout Abbott, Saco, second vice-president; Judge Benjamin F. Cleaves, Portland, third vice-president; Mrs. J. H. Huddleston, Orono, secretary; Mr. Arthur Tiffin, Augusta, treasurer.

Foreign Correspondence.

LONDON LETTER

(From our own correspondent)

London, *December 17, 1924.*

NEW HOUSE OF COMMONS AND PUBLIC HEALTH

It was the conservative Disraeli who said that the first aim of a statesman should be to ensure as far as possible the good health of the people of a country, and the Government now in power appears to be about to act up to the teachings of one of its most distinguished leaders and to take steps in two directions to maintain public health at a high standard. The most important health question of the day in all civilized countries, and especially in an industrial overcrowded country as Great Britain is, is that of housing. In the cities and towns large and small there are slum areas highly prejudicial to health, while the character of the houses in some rural districts is distinctly bad. Moreover, there is a grave insufficiency of houses throughout the country.

It is therefore encouraging to know that the Minister of Health, whose department is responsible for the building of houses, is an able, practical man who has had experience already as Minister of Health. Mr. Neville Chamberlain is a son of the late Joseph Chamberlain, a statesman who enjoyed perhaps the confidence of the country to a greater extent than any public man of his time. Mr. Neville Chamberlain was trained in the same school as his father was, in the municipal government of the largest provincial city of England, Birmingham, which on account of the wise organization and management of its municipal affairs is regarded as a model. Mr. Neville Chamberlain promised to be a success during his too brief first term of office, and it was at his own request that he became again the director of housing operations in Great Britain. Given a free hand and provided that he is treated with fairness by master builders and workers Mr. Chamberlain is more likely to solve the housing problem successfully than anyone and thus may prove the greatest factor in the progress of preventive medicine of this generation.

SMOKE ABATEMENT IN GREAT BRITAIN

Another advance towards a high ideal of public health is to be made in respect of smoke abatement. Owing to the humid atmosphere of these islands and the vast and careless consumption of soft coal, the large cities of this country are cursed with more than their fair share of polluted air. Indeed, at this time of the year the consequences of this disability are frequently strikingly exemplified. During the past week night has virtually reigned in London for a period of sixty hours or so entailing not only grave ill effects to health but immense money losses, further handicapping an already too greatly handicapped industrial condition. Unfortunately in this country the inhabitants are not sufficiently alive to the advantages of a central heating system, but adhere for the most part to open domestic grates in which is consumed soft coal, with the result that innumerable chimneys are constantly belching forth thick, dirty smoke. According to Mr. David Brownlie, writing in the *Spectator,* December 13th last, black smoke can be completely wiped out of existence by technical methods that are now available and perfectly familiar to many chemists. After dealing with methods for eliminating black smoke from factory chimneys he proceeds to point out how the question of smoke from household fires may be settled satisfactorily. Roughly speaking fifty per cent. of the smoke of this country is due to household fires, which Mr. Brownlie avers could be reduced by fifty per cent. even when retaining the use of raw coal. The main solution of the black smoke problem is the low temperature carbonization of raw coal, so as to remove from it all the smokeforming elements, giving a residual smokeless and freeburning fuel.

DRUGS AND RHYTHM

Professor W. E. Dixon, professor of pharmacology in the University of Cambridge, speaking at a meeting of the Royal Society of Tropical Medicine held in Chandos Street Cavendish Square on December 11th, on scientific aspects of drug taking, said: "When I took Indian hemp experimentally, the rise and fall of the wave sensations were most delightful. Half the pleasure of smoking is due to the rhythm. One professor in Cambridge can only think properly by touching all the gateposts that he passes, and if he misses one, he has to go back to touch it to maintain the rhythm.

CANCER OF THYROID

At a meeting of the Section of Surgery of the Royal Society of Medicine held in London on December 3rd, under the presidency of Mr. Herbert J. Paterson, a discussion on the diagnosis of malignant disease of the thyroid gland was opened by Mr. James Berry. In the course of his remarks Mr. Berry pointed out that the commonest degenerations or ordinary goitres were fibrosis and calcification. The statement had recently been made in America that adenomata of the thyroid having a fibrous star shaped centre were apt to become malignant, but Mr. Berry definitely dissented from that view. In his own series of 373 cases from which he had removed solid, not cystic, adenomata only three or four eventually became malignant. The presence of a recently noticed hard lump in the thyroid region in middle age or later should always arouse the suspicion of malignancy, even in the absence of other sign, though most such hard tumors were not malignant. Careful palpation helped greatly in the differentiation. Hemorrhage was very common in thyroid tumors, but this was no indication of malignancy; indeed, among many cases of cystic adenoma and others in which bleeding occurred he had never seen any considerable spontaneous hemorrhage within a malignant thyroid tumor. It was seldom that patients with innocent goitre complained of difficulties in swallowing; even when the pharynx and esophagus were displaced it rarely was a permanent occurrence. But in malignant disease of this part, when the disease began at the back, dysphagia was often an early and important sign. Error was here also possible. However, Mr. Berry said that one of his main objects in bringing forward the subject was to draw attention again to the class of innocent thyroid swelling, which was mistaken frequently for malignant tumor. In the present day, when operations for thyroid disease were becoming increasingly easy and safe, there was a danger lest severe operations

hould be needlessly undertaken. He stated very efinitely that removal of the whole thyroid gland hould never be carried out, even for carcinoma of t. He had never done so himself, nor felt that he ught to have done it. He laid special emphasis on he fact that in the innocent variety of tumor there as nearly always present in the patient a waxy allor, which indicated commencing atrophy. It was he beginning of what was seen more markedly in dvanced myxedema. This waxy pallor was prac- ically always absent from the patient who had true alignant disease at that early stage before the rowth had penetrated the capsule. He had been any times impressed by the apparent general well eing of patients who were suffering from even ad- anced and extensive malignant disease.

PARIS LETTER

(*From our own correspondent.*)

PARIS, *January 10, 1925.*

CANCER RESEARCH

There is much talk of cancer here just now. In he first place there is the example set by heroic Professor Bergonié. It is the pride of France hat in spite of that ultra centralization bequeathed y Napoleon as a heavy legacy, there are in provin- ial cities more or less great physicians, surgeons, nen of science, who successfully fight the lure of the apital and who, sustaining life the while on emolu- nents miserably inadequate—generally with a fam- ly to support—hold up the torch of knowledge, ather around them veritable disciples animated by he same enthusiasm, and in the quietude of their entury old laboratories achieve epoch marking dis- coveries. As a rule they remain unknown to the nultitude, for they do not seek publicity, and when erchance a Nobel Prize falls their way the inquir- ng reporter sets forth to interview them with a hrug of the shoulders, as if to say: "Who the levil's he? Never heard of him before."

COMPLETE SACRIFICE

Such a one was Professor Bergonié, martyr to ex- erimentation with x rays and radium. Fingers, hen an arm were amputated; cancer developed but lacidly he continued his investigations, studying the ction of the atomic bombardment upon living cells n order that human lives might be saved. He was hirty-eight years old when Röntgen made his dis- overy in 1895, and from that time he consecrated is life to the study of the therapeutics of the x rays nd subsequently of radium. When cancer devel- ped he followed minutely the progress of the dis- ase. When he knew that he was doomed, he gave is small fortune for the creation of an institute for ancer research; before his death he gave his very ody to science, and the autopsy merely confirmed he clinical testament that he had left. Undeterred, ther modest savants are following in his footsteps nd Dr. Demenitroux died a few days later after levoting his life to the commercial production of horium. And Dr. Demenitroux, in his turn, has een followed to the grave by M. Marcel Dela- nande, his associate and collaborator. He was only hirty-four years old and was a former pupil of Madame Curie.

A GENERAL INQUIRY

Professor Bergonié has not died in vain, for his end has struck public opinion in forceful manner, fitly preparing the ground for a campaign for nation-wide action against cancer. France is realizing that while her population is decreasing steadily, cancer, equally steadily, is claiming more and more lives each year. So much so that the admirable organization known as the Franco-Anglo-American League against Cancer cannot collect funds fast enough to relieve the stricken, despite the untiring activity of the devoted band of men and women at its head. Of these, Mme. Henri Hartmann, née Lucy Deharme, an American who married the well known French savant, has just received from the Minister of Health the Cross of Knight of the Legion of Honor for her work as president of the Aid Section of the League.

AT THE ACADEMY

Public concern in connection with cancer is such that the echo thereof has reached the Academy of Medicine, which grave and reverend body, it must be confessed, it not invariably up to the minute. At its last sitting, the Academy received with favor a communication from M. Charton, of Besançon, concerning the prophylaxy of cancer. M. Charton outlines the results of cancer research to the present day and comes to the conclusion that there is room for much coordination. Undoubtedly this is so. Undoubtedly, also, the general practitioner could furnish interesting data if there were a centralizing organization ready to welcome his reports and figures. M. Charton asks the Academy of Medicine to become this centralizing body as he considers that, alone in France, it is in a position to appeal to the entire country for help. Perhaps, eventually, such a nationwide inquiry might help to solve the controversial questions of heredity and contagion. Moreover, the inquiry would certainly tend to discredit utterly the everincreasing number of quacks. It is to be hoped that the Academy of Medicine will give a favorable answer to the proposal.

POINTS OF QUESTIONNAIRE

Before taking any action the Academy will await the report of its commission on cancer, to which the matter has been referred. The idea is to reach every practising physician in the country and to avoid a cumbersome questionnaire, in order to facilitate the tabulation of the replies. It is felt that three questions should be sufficient, to wit:

1. What is your personal opinion, as based on observations in the course of your practice, on the transmission of cancer by heredity; give details of typical examples of socalled cancer families;

2. What is your personal opinion, also based on practical observations, on the transmission of cancer by contagion; if possible, cite typical cases;

3. Will you undertake, in the course of the next six months, to study any cases of cancer among your patients from the double point of view of heredity and contagion?

SUGGESTION FROM RUSSIA

In the meanwhile interest is manifested here in reports from Russia—published in the first instance in *Pravda,* the official Soviet newspaper—that Dr.

Molotkov has read a paper before the All Russian Congress of Ear, Nose and Throat Specialists relative to his method of treating concerous growths by cutting the nerves round the spot affected. Professor Grekov declared that experiments carried out at his clinic have so far confirmed Dr. Molotkov's theory. Several French research workers are particularly interested in this news because of past experiments on the same lines made in this country.

PROFESSOR FAURE

Nearer home, Professor J. L. Faure, one of the leading surgeons of the younger school in France, who has just been elected to the Academy of Medicine, has published an exhaustive work on uterine cancer (*Cancer de l'Utérus,* Gaston Doin, 8, Place de l'Odéon, Paris). In his 230 pages, accompanied by more than one hundred figures, Professor Faure deals with every phase of a question which was so controversial not so many years ago. He lays particular stress on the fact that "Cancer of the uterus presents absolutely different conditions according to whether it attacks the collar or the cavity." Professor Faure, naturally perhaps, favors surgical intervention, but he is careful to indicate that the dominating question is that of treatment, as present in the stage of complete evolution, with the consequence that no one can say whether that which seems true today will remain true tomorrow. As to results, from 1896 to 1906 the professor hesitated to operate for cancer of the uterus; nevertheless the results obtained induced him to persevere. He is a partisan of abdominal hysterectomy as against vaginal, and in this connection he gives full credit to Ries (Chicago) and Clark (Philadelphia). During the last three years Professor Faure has perfected his technic by the addition of Mickulicz drain and he has succeeded in reducing mortality from eleven per cent. to three per cent.

VIVISECTION AGAIN

The French public—as Macaulay might have said—in one of its periodical fits of morality, has again manifested concern regarding vivisection. The sensational press has been devoting space to horrible tales told by persons—anonymous for the most part—who assert that the neighborhood of institutions devoted to research resound with the pitiful shrieks and howls of the victims. It is the vivisection of dogs more particularly that stirs the readers of these newspapers. At as result the Minister of Health considered it necessary to send to the Academy of Medicine a letter proposing the limitation of experiments on live animals and also State supervision of laboratories where vivisection is practised, in order that such supervision might prevent "acts of useless cruelty."

PUBLIC REASSURED

Professor Charles Richet, whose versatility continues to be marvellous, for he figures in most controversies, from evoking spirits to remedies for tuberculosis, immediately jumped into the breach and asserted with characteristic impetuosity that, after the horrors of war, vivisection painted at its worst is a mild affair, and also that everything is justifiable if the result be the saving of human lives. The majority of Professor Richet's *confrères* are not so impulsive. They requested Dr. Balthazard to draft a reply to the Minister. Dr. Balthazard has had long experience of French laboratories. Naturally, he points out in the first place that no man of science would commit "acts of useless cruelty." Furthermore, those engaged in research have not waited for a public outcry in order to reduce to a minimum the number of such experiments. Finally the cinematograph has come, in its latest improvements, to restrict vivisection still further. Consequently the French world of science repudiates the allegations levelled against it.

LATIN AMERICA LETTER

(*From our own correspondent*)

Canal Zone, *January 6, 1925.*

STANDARDIZED QUARANTINE REGULATIONS

At the plenary session of the Pan-American Sanitary Conference held at Havana, Cuba, November 5 to 12, 1924, a sanitary code was designed to standardize quarantine procedure throughout the world. The code was signed and will be presented to the representatives of the eighteen nations for its ratification at the conference. Many matters of international sanitary importance were discussed at this conference. Assistant Surgeon General John D. Long, U. S. P. H. S., was present as representative of the United States. Dr. Carlos Enrique Paz Soldan of Peru was elected president for the coming year. Lima, Peru, has been selected for next year's meeting.

FOURTH PAN-AMERICAN CONGRESS OF CHILD WELFARE

Surgeon C. P. Knight, chief quarantine officer of the Panama Canal, has recently returned from South America where he went as a delegate to the Fourth Pan-American Congress of Child Welfare held at Santiago, Chile, November 12 to 19, 1924. The other delegates representing the United States were Professor S. M. Lindsay, of Columbia University, Miss Katherine Lenroot, assistant chief of the Children's Bureau, Miss M. McHugh, assistant director of the National Catholic Welfare Council of Chicago, and Mrs. M. C. Migel, of New York.

The congress was attended by representatives from nearly all the countries of Central and South America and the West Indies. By special invitation, Dr. René Sand of Belgium was present as an observer. He is well known on account of his affiliation with Red Cross work. The congress was divided into three sections, medicine, sociology and hygiene, the sessions being held mornings and afternoons. Many excellent papers were read and all showed that great progress is being made in these countries in the field of child health conservation.

During the conference the delegates were extensively entertained by civic societies of Santiago, which included daily sightseeing trips, various luncheons and banquets. After the congress most of the delegates proceeded to Buenos Aires, Argentina, to attend the Congress of Sociology which was held in that city the latter part of October. Professor Lindsay will then return to Lima, Peru, to attend the International Scientific Congress in December.

Of special interest to the delegates was the visit to the milk stations that have been established in the

city of Santiago and other cities in Chile. The National Society for the Protection of Infancy has established in Santiago eleven milk stations locally known as Gotas de Leche. At these stations milk is pasteurized and then distributed free to indigent cases. They are similar to some of our health centres in the United States.

NEW QUARANTINE REGULATIONS OF JAMAICA

The Quarantine Board of Kingston, Jamaica, has just issued new quarantine regulations with special reference to plague, yellow fever, smallpox and influenza.

The board considers the following countries as plague infected: Ecuador, Chile, Peru, Argentine, Brazil, Uruguay, Paraguay, Cape Verde Islands, Hong Kong, Azores, Ceylon, China, Java, Greece, Hawaii, India, Indo-China, Japan, Dakar, Straits Settlements, Chios Islands, Zanzibar, British East Africa, Madagascar, Mauritius, Rhodesia, Siam, Syria, Constantinople, Algeria, Jaffa, Haifa, Lisbon, Portuguese West Africa, Barcelona, Cartagena (Spain), Valencia, Malaga, Mesopotamia, Bolivia, Canary Islands, Tunis, Morocco, Uganda, Celebes Islands, Russia (certain provinces), Siberia, Union of South Africa and West Africa.

The board considers the following countries infected with yellow fever: Bahia and Pernambuco, Brazil; San Salvador; Spanish Honduras (Pacific Coast); and West Africa (French Dahomey).

The regulations compel passengers from Colon, Panama, Cartagena, Puerto Colombia, Santa Marta, and from the Republic of Mexico, who desire to land at Kingston, to show marks of recent successful vaccination, or to submit to vaccination on voyage, or be vaccinated at the detention station and remain there until evidences of a take are present, or to remain there fourteen days.

Passengers from Costa Rica, Guatemala, Cuba, Haiti, Santo Domingo, Spanish Honduras and Nicaragua must be vaccinated on arrival or show evidences of recent take.

The board considers influenza a quarantinable disease and passengers are required to be two and a half days at sea before arrival and the ship surgeon must certify that there is no illness on board at the time of arrival.

LIQUOR FILLED TRUNKS SEIZED BY ZONE POLICE

As is customary with the Canal Zone Government, the enforcement of prohibition is directly in the hands of the Governor, and this power is delegated to the Police Department of the Canal.

While an army transport was lying at the Balboa pier waiting to proceed to San Francisco, two heavily laden trunks arrived at the dock consigned to a person whose name was not on the list of passengers. Before the arrival of the trunks, the police officer on duty at the dock had been tipped off by telephone that trunks filled with booze were leaving Panama City for the docks. The driver of the truck was arrested but later relased as he was an innocent party to the transaction. The trunks were taken to the police station and then opened, when it was estimated that there were six hundred dollars worth of different kinds of spirits. The contents will be dumped into the Bay of Panama

CANAL ZONE SANITATION

The Report of the Canal Zone Health Department for the year 1923 has some very interesting data regarding the work of protecting the Canal from disease. While the quarantine division is chiefly concerned with preventing the introduction of disease from foreign shores, the division of sanitation does the work within the Zone and in the terminal cities of Colon and Panama. The Division of sanitation is interested in preventing a possibility of spread of plague by eliminating the rat and in preventing yellow fever and eliminating malaria by its unusually good mosquito control. In his report to Colonel Chamberlain, the chief health officer, Dr. Dalferes P. Curry, in charge of the division of sanitation, makes the following remarks: "As a result of the painstaking work by the sanitary forces and by splendid cooperative efforts of other divisions of the Panama Canal, the terminal cities are approaching a condition which would render the spread of plague most unlikely even if a human case or an infected rat were introduced from some vessel. No case of human plague and no infected rat have been known to exist since 1905, in which year two colored laborers contracted the disease at La Boca and died. Many thousands of rats are caught each year and examined at the laboratory, but no case of infection has been found in many years.

Malaria among the employees for the year was 19 in 1000. The average rate during the first ten years of construction was 393 in 1000 and during the last ten years was 28 in 1000. The rate of 19 in 1000 for the year just ending is an indication of the continued efficiency of the Health Department in this direction. Assistant Surgeon General Henry R. Carter, United States Public Health Service, who took such an important part in the sanitary campaign during construction days, recently visited the Zone and expressed himself as astonished and delighted at the results now obtained by the Division of Sanitation. Along with efficiency has come economy. The sanitary forces are gradually being reduced, a step made possible by the change from temporary to permanent measures of control. There is no foundation for the occasionally heard statement that sanitation is being neglected or that the physical welfare of the Zone inhabitants is less regarded than formerly.

HUMAN PLAGUE IN PERU

Under date of November 11th, Peru reports human plague as follows: In Lima, thirteen cases, ten deaths; in Callao, one case; in Huancabamba, six cases; Chancay, one case; Miraflores, one case.

GENERAL PERSHING VISITS THE CANAL ZONE

The delegation headed by General John R. Pershing, including Admiral Dayton and ex-Congressman Hicks of New York, arrived on the battleship *Utah* en route to the Ayacucho Centenary that will be held in Peru in December commemorating the decisive battle which gave Peru its independence from Spanish dominion. During his stay here General Pershing and party were entertained by officials of the Army and Navy, the President of Panama, the Governor of the Panama Canal and the American Chargé d'Affaires.

Book Reviews

LISTER

Lord Lister. By Sir Rickman John Godlee, Bt., K.C.V.O., M.S., F.R.C.S. Third Edition, Revised. Oxford: Clarendon Press; New York: Oxford University Press, 1924. Pp. 686.

Little need be said of this most attractive work on the life and work of Lord Lister. Works such as this one should form the background of every medical library. The life, trials and accomplishments of Lister form one of the most fascinating chapters in the history of medicine if not in science. Godlee has approached his task with reverence which has not been marred by a lack of clarity and human understanding. The present, third edition of his work contains a résumé of the present day treatment of wounds, including the methods perfected during the war.

DISEASES OF THE EYE

Affections de l'oeil en médecine génêrale diagnostic en traitement. Par F. Terrien, Professeur Agrégé à la Faculté de Médecine, et G. Cousin, Chef de Laboratoire d'Opthalmologie à la Faculté de Médecine. Paris: Masson et Cie., 1924. Pp. viii—510.

The work is divided into three large parts. The first treats in a general way of examination of the eye and of its functional disorders, the second is devoted to the elucidation of symptoms as they occur in diseases of the eye and its neighboring organs, and the third, the largest and most important part, takes up ocular conditions in their relation to general diseases. The work is distinctly clinical in character, and aims chiefly to aid the general practitioner in recognizing and treating eye conditions as met with in general practice. A rather interesting, though all too short, chapter is devoted to the eye in old age, while syphilis and tuberculosis of the eye are treated at commendable length. The authors have succeeded in grouping together in a systematic and concise manner all that is known up to date of the interrelations between the internal secretions and the eye, and this chapter on endocrinology as well as the one on neuro-ophthalmology deserve special mention. Taken as a whole this can be recommended as a dependable reference book for both the specialist and the general practitioner.

X RAY THERAPY

The Principles and Practice of Röntgen Therapy. By I. Seth Hirsch, M.D., Director, X Ray Department, Bellevue and Allied Hospitals, New York. With Formulæ and Dosage Table, by Guido Holzknecht, M.D., Professor of Röntgenology, University of Vienna. Three Hundred Illustrations and Fifty-seven Tables. New York: American X Ray Publishing Company. 1925.

This excellent work by an eminent New York radiologist is a comprehensive attempt to formulate the principles upon which modern röntgen therapy is based, and to standardize the technic of the application of the radiation as a therapeutic agent. The use of the x ray for this purpose, as the author points out, involves physical, biological and chemical problems which must be understood if the radiation is to be applied in a rational manner. The author has summarized the enormous mass of literature written on this subject, with a critical eye and with severe judgment.

From the great volume of experimental research and theory he has selected what appeared to be most fundamental and important and has arranged his data in logical order and sequence. Throughout the book the author stresses the necessity of avoiding overdosage with its consequent depression of the general vitality of the organism. He objects to the massive dosage method of the Germans and furnishes proof for his contention that the vital resistance is so greatly depressed by such methods that the treatment defeats its own purpose.

Incorporated in the body of the work is a section of the dosage system of Holzknecht, a system which correlates practical and clinical experience in x ray therapy and puts it in tabular form, giving formulæ for treatment in various diseased conditions. The author has divided his work into three main divisions, the generation, measurement and application of x rays; under the last heading he goes thoroughly into the theoretical, practical and clinical aspects of x ray dosage.

The author and publishers have combined to produce a most excellent work, which not alone covers the ground thoroughly, but presents the subject in an attractive and interesting form. In addition, there is presented a vast amount of valuable information on the subject of cancer, which furnishes the most active field for röntgen therapy.

Altogether the volume is one of unusual quality and can be commended to medical practitioners and research workers in this field.

PRESCRIPTION WRITING

Essentials of Prescription Writing. By Cary Eggleston, M.D.. Third edition, revised. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 146.

This small book is very carefully prepared, as usual, and full of information on the subject that it treats. Owing to the fact that Latin is not now required as necessary for entrance into many medical schools, the author has been compelled to give considerable primary instruction in Latin, if prescriptions must still be written in Latin. The reviewer thinks that if medical schools do not require Latin as an entrance requisite, it is hardly necessary for the professor of pharmacology or therapeutics to teach Latin, as it is a hopeless task to cause the medical student to write correct Latin prescriptions without more knowledge of that language. The author's list, on page thirty-two, of "verbs in common use in prescriptions" is not quite a statement of fact. Very few of the verbs he lists are in common use, in fact, they practically never appear on prescriptions of physicians of the present day.

The reviewer regrets that the author of this instructive book did not see fit to make the metric system more popular. His prescriptions still represent three and four ounce mixtures instead of fifty or one hundred cubic centimetre mixtures, and if he admits, as by foot note on page sixty-three, that five c. c. represents more exactly the ordinary teaspoonful, it is hardly correct to have prescriptions com-

puted on the mistaken idea that a teaspoonful represents only four c. c., or one fluidram. If five c. c. represents a teaspoonful, as is most generally the fact, twenty doses would equal one hundred c. c., and the computation of doses in the metric system becomes very simple.

On page seventy-five is illustrated a five per cent. solution of phenol, and the amount ordered is four ounces. This rather seems like *reductio ad absurdum.* Why not order phenol 5, water up to 100 c. c.?

As to practical prescription writing, the modern clinician would never spend time to write such instructions as this: *Misce et fac emulsum secundum artem.*

CLINICAL MEDICINE

Einführung in die klinische Medizin. Eine kurze Darstellung ihrer Grundbegriffe für Studierende. Von Walter Marle, Generaloberarzt a.D., Berlin. Mit 379 Abbildungen im Text. 1. Band. Urban & Schwarzenberg, 1924.

This *Introduction to Clinical Medicine* is intended to supply the medical student, who is beginning the study of the clinical aspect of medicine, with the necessary knowledge and it is recommended for preliminary study. The illustrations are well selected from various authors. A bibliography is appended to each chapter. The material presented is necessarily limited to fundamental facts which are necessary for the comprehension of clinical methods of examination and study. The first portion of the book deals with general pathology; the second part takes up clinical microbiology and the theory of immunity; the third portion deals with general methods of examination and diagnosis and the fourth portion is concerned with general therapy including all its various branches and types of treatment. While much is necessarily omitted that is found in the larger textbooks, this book contains much that is valuable for the medical student and also much that can be found in no other books. It is admirably adapted to the purpose for which it was written.

EAR, NOSE, AND THROAT DISEASES

A Manual of Diseases of the Nose, Throat and Ear. By E. B. Gleason, M.D., LL.D., Professor of Otology, Medico-Chirurgical College Graduate School, University of Pennsylvania. Fifth edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 660.

The value of this very serviceable, and in some respects excellent manual, is considerably impaired by the retention from former editions of some out of date and antiquated matter which may possess some historical interest for the specialist, but is surely out of place in a work primarily designated for students and general practitioners whom it is intended to supply with the essential facts of rhinology, laryngology and otology, in as concise a form as possible. It is questionable whether such topics as tonsillotomy (but rarely performed nowadays by any progressive laryngologist), galvanocautery and caustic treatment of anterior hypertrophies of the turbinates, anterior inferior turbinectomy, or the employment of paraffin in any kind of nasal work, can claim a rightful place in a modern textbook of laryngology. We also doubt whether an adenoidectomy can properly be performed without anesthesia, in fairness both to the patient and the operator, except in very young infants. We wish we could bring ourselves to agree with the author's evident preference for doing tonsillectomy in adults under general anesthesia as against local. While the subject is still *sub judice,* as it were, there is an unmistakable trend of recent years toward employing local anesthesia in all such cases, especially in view of the preponderating number of lung abscesses following general anesthesia.

However, with these exceptions, we can heartily recommend this treatise both to the general practitioner and to the specialist as a useful textbook containing in a condensed form most of the salient points on diseases of the ear, nose, and throat. Deserving of special praise is the treatment of the sinuses, which is thoroughgoing and quite exhaustive, and the hearing tests, the mastoid operations and the functional testing of the labyrinth. A valuable appendix to the book is a list of formulas elucidated by the author's interpolations, occupying some forty pages, and containing a rich and varied assortment of prescriptions for sprays, washes and the like, of considerable value to the practising laryngologist.

PSYCHIATRY

Manual of Psychiatry. For the Medical Student and General Practitioner. By Paul E. Bowers, M.S., M.D., Philadelphia and London: W. B. Saunders Company, 1924. Pp. 365.

This book has many commendable features. The subject is clearly handled. The material is presented in a straightforward, simple way. This makes the book readable and an accessible reference book. The material is handled from the present day, we might say most modern viewpoint. The general practitioner or medical student could not do better for a first book on psychopathology.

PSYCHIATRY

Aids to Psychiatry. W. S. Dawson, M.A., M.D., Oxon., M.R.C.P., Lond., D.P.M. New York: William Wood and Company, 1924. Pp. 477.

A brief outline of the various more common psychopathological affections which contains the diagnosis, differential diagnosis, treatment and prognosis of the conditions covered. A useful guide for nurses and general practitioners who encounter these cases from time to time. In formulating his concepts there is a compromise between the descriptive psychiatry of Kreaplin and some of the more modern functional concepts. Somewhat too little recognition is given to the dynamics of the unconscious.

MOTHER AND CHILD

The Canadian Mothers' Book. By Helen MacMurchy, M.D., chief of the Division of Child Welfare of the Dominion Department of Health. Illustrations. Ottawa: Department of Health, 1923. Pp. 135.

This little book has a subtitle telling the reader that it is *The Little Blue Book, Mother Series Number 1,* and its attractive blue cover confirms the statement. Dr. MacMurchy, the author, is a well known writer on subjects related to infant and child health and welfare, and in this work she follows her usual method of presenting her subject in a cheerful, informal and sympathetic yet thoroughly practical and scientific manner. Excellent illustrations add to the book's attractiveness and enhance the value of the text.

LOVE

The Nature of Love. By Emanuel Berl. Authorized Translation by Fred Rothwell. New York: The Macmillan Company, 1924. Pp. xi, 278.

This book is written with a stimulating clearness which apparently has in no wise been marred in translation. It is aphoristic in the richness of its statements as the author pursues the nature of love. He seeks in vain to find love's causality in any of the accepted conceptions of its origin. Its nature cannot be learned thus. Nor do its biological significances nor its social manifestations bring it to a definition. Psychology may hunt down its pluralities, finding some single simpler manifestation behind a long train of repetitions, as psychoanalysis has done. This does not entirely satisfy the author, nor can there be, he believes, an attempt on the part of such psychology to identify these dynamisms without a resort to metaphysics.

The author himself finds amid the varieties of love's manifestations, its seeming deceptions, its apparent instability, three distinctive elements, which he confesses himself unable to reduce further. Love is a thing dynamic, a will, *"the love of life for life,"* and as such, subjective. Then it is something pertaining to the object, the intuition of that object, which has no goal beyond. Finally, it is a fusion of these two aspects, which synthesizes this intuition with the subjective desire. Thus is love not defined but more clearly understood in its functional activity. Very suggestive, too, is the author's discussion of hate as the negative of this love of life; the hatred of life, which would destroy it; or, perhaps, that which withdraws into a passive rejection of it. Berl reaches for a mystic something beyond the separate revelations of psychology, but the presentation of his thought clarifies our psychological thinking without losing us in mystifying clouds.

SYMBOLISM OF THE CANE

The Gold Headed Cane. By William Macmichael, M.D., with an Introduction by Sir William Osler, Bart., M.D., F.R.S., and a preface by Francis R. Packard, M.D. New York: Paul B. Hoeber, Inc., 1925. Pp. 260. Illustrated.

As is well known to the student of medical history, the cane, and particularly the cane with a head of gold, silver or ivory, has a definite symbolic significance. In olden times, it was considered to be an essential part of the equipment of every physician, and was associated with the wig and ring, all of which stood for deep learning, wisdom and power. Other forms of the cane, with a similar symbolic meaning, were probably the herald's staff, the wands of primitive peoples and of fairy tales, the caduceus of Hermes, the wand of Aesculapius, the staves of sheriffs and constables, and the surgeon's club. The making of a good appearance was probably the strongest motive that led to the carrying of a gold headed cane by physicians, but it has been suggested that others may have entered in, as for instance the old beliefs that gold was lifegiving and had medicinal properties, and that fustigation was a sovereign remedy, and also perhaps the need of a weapon for selfdefense. The head of the cane was usually hollow and perforated so that it could hold aromatic preparations to be inhaled as preventives against contagion. This particular cane had instead of a knob a cross bar for a top, probably, Munk has suggested, because Dr. Radcliffe, its first owner, was "a rule unto himself," and wanted a cane different from those of other physicians.

Such a gold headed cane tells its own story through the pages of Dr. Macmichael's book, from 1869, when it acquired a head and so became "conscious of existence and capable of observation," until 1825, when it was deposited in a corner closet of the library of the New College of Physicians, London. The reader is pleased to learn through Dr. Packard's preface, however, that the cane was not condemned to eternal oblivion, but now occupies a glass case in the library of the college, where visitors may gaze and admire. Dr. Munk in a third edition published in 1884 wrote a continuation of the story in imitation of Macmichael's style, bringing the narrative down to 1871.

The cane was carried successively by Radcliffe, Mead, Askew, Pitcairn and Baillie, and its head bears engravings of their various arms. Reproductions of these form the vignettes of the five chapters into which the volume is divided. Under the presidency of Sir Henry Halford, 1820 until 1844, the College of Physicians underwent a great awakening, including the acquirement of a beautiful new home and the inauguration of the famous evening meetings. Dr. Packard writes that doubtless a great part of Sir Henry Halford's success was due to the seconding of his efforts by Macmichael. "In nothing could he have succeeded better in awakening renewed interest in the venerable college than by directing attention to its past history and to the achievements of the illustrious men who had been connected with it. It was probably this desire which led Macmichael to utilize his erudite knowledge of the subject in the compilation of the fascinating book to which he gave the name of 'The Gold Headed Cane.'"

Dr. John Radcliffe, the first owner of the cane, gave to Oxford the Radcliffe Infirmary and the Radcliffe Camera or Library, originally designed to be the scientific part of the Bodleian Library, and was the founder of the Travelling Fellowships. The account of Richard Mead, the second owner, is perhaps the best in the book. He was a complete contrast to his predecessor—a scholar where Radcliffe was ignorant of books; courtly and polished where Radcliffe was rude and overbearing. Dr. Johnson once said of Mead that he lived more in the broad sunshine of life than any man he knew. With the name of the next possessor of the cane, Anthony Askew, we associate the famous Bibliotheca Askeviana, priceless treasures lost to science through an auction sale. Pitcairn's story is rather vaguely told and we learn comparatively little about him. Baillie, the last carrier of the cane, was the nephew of John and William Hunter and to him more than to any other man is due the close combination of pathology with clinical medicine.

Macmichael's style is delightful in its quaintness, humorous quality, and intimacy of narrative. The present edition follows the text and illustrations of the second edition, which was revised, augmented and published by the author himself. The technical makeup of the book follows, in the usual style of the publisher, the highest standards of the printing and publishing arts.

Medicoliterary Notes.

According to the London *Daily Telegraph,* the English production of *What Price Glory?* has aroused almost as much excitement among naval and military authorities as it did in this country. The reviewer says: "As a picture of war, the play is ridiculous, to British eyes at any rate, and to many Americans as well. Accustomed as we are to stretching our imaginations in the theatre, we cannot believe that a man like Flagg could remain in command of a company for a single day. Our own staff colonels are not in the habit of allowing a mere captain to tell them what he thinks of the Army in general and the staff in particular, in terms more forceful than polite, as Flagg does. Nor should we expect to see our officers and N. C. O.'s getting drunk together and grappling with each other on the floor of a French *estaminet.* Several Americans have assured me that things like these did happen in the American army; one of the authors of this play was in the Marines himself. But still I am loath to believe it. Any way it is a matter of no great importance, for this is a play of character, not of incident. The events may be false or exaggerated, but the people are alive. Every sentence, every joke, every swear word even, rings true. . . . War and the training for war make men like Flagg and Quirk. . . . A play like *What Price Glory?* is a wholesome reminder that there was another side to the medal."

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Eye Hazards in Industrial Occupations is the title of a recent publication by the National Committee for Prevention of Blindness, prepared for the use of safety engineers and inspectors, industrial physicians and nurses, and for government, trade association and social agency officers.

* * *

Chinese scholars reason thus: For centuries China lived the life and cherished the ideals that Europe is living and serving today. She has passed through that experience and now she has retired to a life of leisure. She has learned that the really important task of living is not to contrive new inventions and machinery, or even to subdue the forces of nature, but to develop the human faculties, and these change very slowly. Those foreign nations that survive as long as China has survived will eventually understand our attitude. The others will die, as many nations whose existence China can recall have already died and completely vanished from the earth.—*Living Age, quoted from Revue Mondiale.*

* * *

Swedish hospitals for the insane are now almost universally using moving picture films selected by psychiatrists as a form of treatment through diversion. Sanitariums for the tuberculous are doing the same for the relief of the states of mental depression so usual among convalescent patients. Films are used also for auxiliary training of the tuberculous and of the deal and dumb.

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The *London Mercury* for October contains a very amusing story entitled The Man Who Stole the Pelican, by I. A. Williams.

* * *

In Japan a Japanese eugenics association has recently been organized and will publish a monthly bulletin for the education of the public in the subject.

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The monthly number of the *Living Age* for November publishes three representative European comments on the Leopold-Loeb trial, the first from the conservative London *Saturday Review,* the second from the *New Statesman,* organ of the intellectual wing of the Labor Party, and the third a translation from the Viennese Socialist daily, Arbeiter Zeitung.

* * *

The Oxford Press has just issued a paper bound pamphlet on *The Debt of Science to Medicine,* by Archibald E. Garrod, who delivered the contents as the Harveian Oration before the Royal college of Physicians of London.

* * *

A recent issue of the *Japan Times and Mail* comments on the present day demand in that country for snakes for medicinal purposes, which is so large that the consumption for the country as a whole has been estimated as between four and five millions, and for Tokio alone as between five and six thousand. About eighty per cent. of these are roasted and powdered or dried and made into pills and capsules. The rest are for table use, boiled, baked or roasted. In some regions the wild snakes are becoming so scarce that snake farms for breeding purposes are being contemplated.

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The Zoological Gardens of London have recently been making an exhaustive study of the influence of weather conditions upon men and animals. Among two of the important conclusions arrived at are that cold is not necessarily injurious if it is dry cold; and that damp is not necessarily harmful unless accompanied by cold. Recommendations for humans are given, drawn from the study in relation to animals.

* * *

Westminster Abbey is being cleaned, renovated and in places restored. Incidentally many forgotten beauties, artistic, architectural and otherwise, are being brought to light, notably in the chapel of Henry V, and in the Erasmus chapel.

* * *

Donald B. McMillan, recently returned from the Artic, should be able to contribute an interesting new page to folk psychology as a result of his sojourn among the Eskimo. "The Eskimo," he reports, "have a very clear and unquestioning belief in an immortal soul. They reverse our ideas of the prospective dwelling places of the righteous and the wicked. Their hell is in the heavens—it seems quite natural when you see an Artic blizzard bearing down upon you—and their heaven is in the warm, sheltering earth."

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Canned whale meat, it is reported, has become an established commodity along the West Coast of Africa, where the entire stock of whale meat caught off British Columbia during last year was sold.

* * *

Tokyo's most famous theater, the Imperial, according to the *Living Age,* is one of the first buildings in the city to arise from last September's disastrous earthquake. It has a revolving stage, a device long used in Japanese theaters, and its decorations and furnishings are planned to give effects of quiet and restfulness, instead of the former gilt splendor in the worst Western taste. Chinese and Japanese theatrical companies will occupy the boards for the greater part of the winter, and there are to be also recitals by the violinist Zimbalist and by Mary Garden.

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Bernard Shaw's play, *Mrs. Warren's Profession,* banned for more than thirty years by British censorship of the stage, is at last to be produced in London. It has appeared in this country, and in France, Germany and Russia, but not in England. Mr. Shaw's comment (*Living Age*) was: "The news is only too true. Now that I have reached the venerable age of sixty-eight in the odor of sanctity, the Lord Chamberlain lets loose on me a terrible play written thirty years ago, when I was a younger tiger fearing neither God nor man—a play which I was depending on him to keep locked up so that I might end my days in peace. . . ."

* * *

America's Interest in World Peace is the title of a pamphlet by Dr. Irving Fisher, of Yale, published by Funk & Wagnalls. It is a plea for America's entrance into the Permanent Court of International Justice at the Hague and into the League of Nations.

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One of the interesting features of the International Health Conference held last May at Wembley, England, was the exhibit and story of the Framingham Health Demonstration, conducted by the National Tuberculosis Association in cooperation with various health agencies in Massachusetts.

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At a recent meeting of the Academy of Sciences in Paris, Dr. Louis Paul le Gendre read a paper in which he propounded a plan for the extermination of stinging mosquitoes by a nonstinging variety which he claims to have discovered in Brittany. He tried the experiment of transporting some of the harmless variety to another department and found that in a very short time they apparently did away with their stinging brothers and completely supplanted them.

Abstracts from Current Literature

ENDOCRINOLOGY

Cancer and Endemic Goitre.—Otto Stiner (*Schweizerische medizinische Wochenschrift*, July 3, 1924) found that in the regions of Switzerland showing few goitres carcinoma of the gastrointestinal tract was less frequent than in those showing the frequent occurrence of goitre. He does not attach any etiological significance to this fact, but he does attach importance to dental caries, as the cantons showing the frequent occurrence of dental caries also show a frequent occurrence of goitre and carcinoma of the digestive tract. This result may be due to the use of nutrition with deficient vitamines.

Treatment of Exophthalmic Goitre.—G. W. Holmes, J. H. Means, C. A. Porter, E. P. Richardson and M. P. Starr (*Boston Medical and Surgical Journal*, August 14, 1924) are of the opinion that iodinization followed by subtotal thyroidectomy while the metabolism is normal, is the best program for the treatment of exophthalmic goitre that has yet been advanced. X ray will still have it place in patients in whom, for any reason, operation is undesirable, or who refuse operation.

Individual Treatment of Goitre with Minimum Doses of Iodine.—Fritz Kaspar (*Wiener klinische Wochenschrift*, July 17, 1924) contained some excellent results in the treatment of parenchymatous goitres, especially in children, with extremely small amounts of potassium iodide. Such a dose has not only a prophylactic value but also has great therapeutic significance, especially in juvenile goitres. In the latter, a large portion of the goitres were made to disappear entirely or for the most part with the daily use of iodine (totaling 0.001 to 0.003 grams of potassium iodide a month) in one to two months, others required 0.001 to 0.004 grams within four to six weeks. About one third of the cases showed at first only little change with this form of treatment. Even parenchymatous goitres in adults and individual recurrent goitres to a great degree showed distinct involution—some within one to two months and others in five to ten months on a monthly dose of 0.001 to 0.006 grams of potassium iodide, but adenomata and colloid goitres remained unchanged. With this dose, with strict individual indication and control the total monthly dose of 0.008 gram of potassium iodide and even a little more may be given harmlessly and successfully.

Congenital Hypogonadism.—Mark S. Reuben and G. Randolph Manning (*Archives of Pediatrics*, July, 1924) report the following findings in congenital hypogonadism: The children are oversized and overweight for their age; the genitals are undeveloped; there are no signs of the presence of secondary sexual characteristics. The mentality is normal. The part below the umbilicus is larger in proportion to total strength than in normal children. The thymus is often persistent; the pituitary may be normal or slightly enlarged. These patients usually present contours of a feminine type associated with general adiposity. The roentgenograms of the wrists shows delayed ossification. The basal metabolism may be subnormal and the sugar tolerance may be normal.

Influence of Thyroidectomy, Gonadectomy, Suprarenalectomy, and Splenectomy on the Thymus Gland of Rabbits.—David Marine, O. T. Manley, and Emil J. Baumann (*Journal of Experimental Medicine*, October, 1924), report the data relative to the effect of these operations and combinations of these gland removals on the thymus gland as measured by its involution, persistence, or regeneration in rabbits. The data of 373 protocols are included in this study, and the following facts are brought out by this statistical analysis: Thyroidectomy hastens involution of the thymus and other lymphoid tissues. Gonadectomy delays thymus involution. Sublethal but sufficient injury of the suprarenal function with intact thyroid prevents thymus involution and causes regeneration even of the involuted thymus. It also causes hypertrophy of other lymphoid tissues. Thyroidectomy prevents thymus regeneration following suprarenalectomy, probably for the same reason that thyroidectomy hastens normal thymic involution. The combined effect of suprarenalectomy and gonadectomy results in certain lymphoid and thymus hyperplasia in rabbits which persists until regeneration of accessory interrenal tissue corrects the physiological defect. The syndrome thus experimentally produced resembles status lymphaticus and is believed to depend mainly on a partial loss of certain functions of the interrenal and sex glands rather than of the chromaffin tissue. The normal and abnormal lymphoid and thymic hyperplasias of infancy and childhood are thought to be manifestations of a functional underdevelopment of the interrenal and sex glands of varying intensity. The socalled lymphatic constitution which underlies or accompanies exophthalmic goiter, Addison's disease, and acromegaly also appears to be dependent on a partial suppression of certain functions of the interrenal and sex glands.

Are Guanidines Present in the Urines of Parathyroidectomized Dogs?—Isidor Greenwald (*Journal of Biological Chemistry*, March, 1924), states that the investigations reported seem to offer good reason for refusing to accept without further evidence, the idea that tetany is due to guanidine intoxication. There are only two well authenticated changes after parathyroidectomy. One is the lowered calcium content of the serum or plasma, and the other is the diminished excretion of phosphorus in the urine. These must be regarded as being intimately connected with the sequence of symptoms observed. No theory of the causation of tetany can be considered adequate if it fails to take both of these into consideration.

Influence of the Suprarenal Gland on the Thymus.—Henry L. Jaffe (*Journal of Experimental Medicine*, September, 1924), presents results based on a study of sixty-six double suprarenalectomized rats, and twenty-one nonoperated controls. Following this operation, there was a secondary hyperplasia of the thymus resulting in enlargement of the organ, the height of the curve of the enlargement being reached in from three to five weeks after the operation. The females show the enlargement more readily than the males, and it is not prevented by a previous pregnancy, occurring even when the animal has lost weight after operation. The explanation suggested for the enlargement of the thymus following double suprarenalectomy is a disturbance of the interrelations between the gonads, the thymus, and the interrenal gland (suprarenal cortex). A possible relationship between the enlargement of the thymus occurring in Addison's disease, Graves's disease, status thymicolymphaticus and that following double suprarenalectomy is suggested.

Treatment of the Endocrine Glands with the Ultraviolet Rays.—J. Saidman (*Bulletin de l'Académie de médecine*, July 22, 1924), reports good therapeutic results in seventeen cases from treatment of the ovaries with the ultraviolet rays. In two cases of the amenorrhea of puberty in girls fifteen and one half and sixteen years of age, menstruation set in after six to ten treatments with these rays. In four young women of eighteen to twenty-five years with scanty, irregular, usually delayed menstruation with pain, the menstruation returned to normal and the pain disappeared in three instances after eight to twelve treatments. Among eight cases of very irregular menstruation attending active tuberculosis of the lungs, peritoneum or joints, the function was made regular by four to fifteen exposures in seven instances. In three women with artificial menopause symptoms following x ray irradiation of the ovaries for fibroids or metrorrhagia, fourteen to twenty treatments partly or wholly relieved the hot flushes and dizzy spells, and in the one obese subject it reduced the body weight. In a young woman of twenty-one years who, since the age of fifteen, had had irregular menstruation, became obese and sensitive to cold, with dry skin and fatigue upon the least exertion, thirteen treatments in two months took off nine kilograms of weight, reduced the waistline by nine centimetres, regulated the menstruation and enabled the patient to work. The most effective dose appeared to be that producing a discrete actinic erythema. A two thousand candle power mercury vapor lamp was used as the source of the rays. At the first sitting the whole body was irradiated in three or four segments for one or two minutes each from a distance of fifty centimetres. At

subsequent treatments the distance was reduced by five centimetres to a minimum of thirty centimetres and the duration increased by one-half to one minute to a maximum of eight or ten minutes. When no erythema followed in six to twelve hours, supplementary local exposures over the hypogastrium, thyroid and lumbosacral region were made, causing a local erythema which assisted the general effect. Two or three treatments a week were given. There were no untoward results other than itching for one to three days.

Electrocardiogram in Cretinism and in Mongolian Idiocy.—Catherine Thacher (*American Journal of Diseases of Children,* July, 1924) states that in pure cretinism, as in myxedema, the T-wave in the electrocardiogram is lowered, flattened or even inverted, and can be brought up to normal by the administration of thyroid. In Mongolian idiocy there is no characteristic change in the electrocardiogram.

Brain Development in Anuran Larvæ after Thyroid or Pituitary Gland Removal.—Experiments conducted by B. M. Allen (*Endocrinology,* September, 1924), served to show that the brains of tadpoles deprived of either the thyroid or the pituitary gland remain undeveloped in proportion to the stage at which the gland was removed, corresponding in this respect to the development of the hind legs in especial and the body in general.

Hyperovarianism and Its Specific Treatment.—By injecting Möbius's serum from thyroidectomized animals A. do Amaral (*Endocrinology,* September 1924), succeeded in benefitting cases of hyperovarianism, causing complete cessation of menorrhagias of long standing by reestablishing hormonic equilibrium.

Differential Diagnosis of Incipient Tuberculosis and Incipient Goitre.—Both these conditions, R. Pettitt says (*Endocrinology,* May, 1924), are characterized in the incipient stage by lassitude, fatigue, weakness, nervousness, rapid pulse, loss of weight, cough, night sweats, and dyspnea In addition to these the goitre patient manifests palpitation, tremor, and heart changes, and has increased appetite, while tuberculous subjects fail in appetite. Until an accurate simple method for the determination of the basal metabolic rate can be perfected, it will be impossible for the ordinary practitioner to utilize this procedure as a diagnostic test.

Use of Seaweed in the Prevention and Treatment of Goitre.—J. W. Turrentine in *Endocrinology,* May, 1924, strongly advocates the administration of iodine in the form of kelp "processed" and made into tablets. Patients so treated have experienced an immediate restoration of the metabolic ratio to normal and prompt subsidence of tachycardia and tremor.

Phagocytosis in Toxic Goitre.—Professor N. Goormaghtigh (*Endocrinology,* May, 1924), has made a microscopical study of two goitrous thyroids, one removed after ligation of the arteries, the other without ligation. Beside the well known lymphoid infiltration of toxic and exophthalmic goitre, he observed a marked phagocytosis of thyroid cells. This was seen both with primary hypertrophy, so-called, and where degenerative colloid areas existed in addition to active lobes. Only those thyroid acini were found to undergo phagocytosis that were newly differentiated and gave evidence of great functional activity.

Tumors of the Adrenal Cortex in Relation to Pseudohermaphroditism.—Knud H. Krabbe reports a newborn male pseudohermaphrodite (*Revue Française d'Endocrinologie,* April, 1924), having labia majora and a clitoris. On one side he had a tiny testicle with islands of tissue resembling that of the adrenal cortex; on the other the testicle was replaced by a tumor of considerable size consisting of corticoadrenal tissues. Both adrenal glands presented marked aplasia. There was also spina bifida with paralysis of the lower limbs.

The author believes the pathogeny of these malformations probably lies in arrested development and disorganization in the lower segments of the organism, the aplasia of the external genital organs and the spina bifida being parallel results of that arrest. The sphere of the adrenal cortex and that of the sex glands are intimately connected in the early stage of fetal life. In the male embryos the sex glands are always purely testicular, while in female embryos they are bisexual, consisting of an external ovarian portion and an internal testicular portion. This latter relation is the explanation of the virilism of women and little girls with adrenal tumors. Krabbe states emphatically that there is no definite proof of the secretion of the adrenal cortex having any relation to the sex organs. All the anatomical alterations recorded may be explained by local relationships, that is to say, the fields of the adrenal cortex and the sex glands are in intimate proximity.

Contribution to the Study of Socalled Cardiac Infantilism: Its Endocrine Pathogeny.—G. Bickel, E. Frommel and J. Hess (*Revue Française d'Endocrinologie,* February, 1924), hold the view that infantilism, in spite of the many distinctive forms under which it has become customary to describe it, is merely endocrine really in etiology, or else of general systemic nature. Cardiac infantilism, therefore, signifies nothing more than a deficient growth of the entire organism where congenital lesions of the heart exist in more prominent degree than those of other organs. They record such a case and show that in it the pituitary, thyroid, and adrenal glands especially were abnormal in histological structure, as were the kidneys and other organs.

Studies on Compensatory Hypertrophy of the Thyroid Gland.—Leo Loeb and Edward E. Kaplan (*Journal of Medical Research,* September, 1924), conclude from the result of the work here reported that feeding of the anterior lobe of pituitary gland prevents marked or even moderate degrees of compensatory hypertrophy in guineapigs, the greater part of whose thyroid had previously been extirpated. This effect is not caused by an admixture of inorganic salts of iodine with the preparation, because iodine in inorganic form is unable to prevent compensatory hypertrophy in the guineapig. The question is suggested whether administration of anterior lobe of pituitary might not be of benefifit in the treatment of toxic goitre.

Review of Another Year's Work in Thyroid Disease.—F. H. Lahey of Boston, in a summary under this title (*Endocrinology,* May, 1924), records the conclusions that hyperthyroidism does not exist in the absence of increased basal metabolism rate and cures of hyperthyroidism are not accomplished without return of basal metabolism rate to normal; that minus degrees of basal metabolism rate may exist in patients free from clinical evidence of myxedema yet made subjectively better by raising the rate to normal with thyroid feeding; that multiple stage measures are life saving procedures in severe hyperthyroidism; that the moderate value of x ray treatment is more than outweighed by its disadvantages; and that thyroid surgery done in a general surgical clinic equipped for the care and study of these cases will show few failures to cure and a mortality rate rarely over and in most cases under one per cent.

Effect of Iodine Upon Gas Metabolism.—Paul Liebesny (*Wiener klinische Wochenschrift,* May 22, 1924) administered iodides internally and determined the basal metabolism. He found that the effect of iodine in large doses upon the metabolism in individuals without disease of the thyroid gland was not uniform. In cases of hypofunction in goitre cases the metabolism is increased up to normal. Cases with hyperfunction show a reduction in metabolism after the administration of small doses of iodine in a large number of cases. There are also cases which respond to such doses of iodine with an excessive increase in metabolism. In the latter cases the iodine medication should be reduced gradually. Hyperthyroidism and exophthalmic goitre should be treated with iodine only when the patients are placed under a constantly careful and reliable control of the energy balance.

Parathyroid Tetany.—L. R. Dragstedt (*Endocrinology,* September, 1924), by feeding special diets to parathyroidectomized dogs and by intravenous injection of large amounts of Ringer's solution, has been able to prevent the development of tetany in these animals. A similar result is attained by the administration of calcium lactate in large quantities. The effect is produced by checking bacterial proteolysis or putrefaction in the intestinal tract with the formation there of highly toxic protein derivatives. Parathyroid tetany is an intoxication and the toxic substances come chiefly from the gastrointestinal tract. Whether calcium supplies a specific physiological deficit in the organism or merely controls the syndrome of parathyroid tetany by its pharmacological action is uncertain. But tetany in pregnant dogs cannot be controlled by calcium, although it can be by Ringer's solution. It appears probable, accordingly, that during pregnancy poisons capable of causing tetany may arise elsewhere than in the intestines.

Goitre Prophylaxis in Switzerland.—According to Hans Eggenberger (*Münchener medizinische Wochenschrift,* July 18, 1924) iodine is not merely a remedy, but an element of nutrition in daily amounts of 0.00004 of a gram. It is an essential constituent of the thyroid secretion, which, when deprived of it, loses its vitally active principle. The effect of iodine in many ways resembles that of the vitamines. It is a converter, a catalyzer. It is subject to the same metabolic laws as chlorine. Insufficient supply results in disturbances whose first manifestation is hypertrophy of the secretory apparatus of the thyroid gland. The inhabitants of goitre districts receive an insufficient supply.

Further Observations on Feeding Interrenal Gland in Cases of Graves's Disease.—S. Shapiro (*Endocrinology,* September, 1924), studied the effects of feeding interrenal gland in twenty cases of Graves's disease, using fifty per cent. glycerol emulsion of fresh ox glands. The principal effects were rapid gain in body weight and improvement in muscle strength, rise of blood pressure, when lowered, to normal, temporary increase in heat production, and relief of abnormal menstruation. Diarrhea disappeared when improvement in general condition occurred. The author considers evidence to be rapidly accumulating that the interrenal glands exert an inhibitory or regulatory control over the thyroid and that a functional interrenal insufficiency plays a fundamental rôle in the development of Graves's disease.

Goitre of Adolescents.—E. Gold and V. Orator (*Wiener klinische Wochenschrift,* April 3, 1924) found that the goitre of adolescents is the actively follicular, proliferating parenchymatous type of goitre, which is almost entirely devoid of colloid. It is predominant in childhood up to the seventeenth year of life. At the period of maturity, on the other hand, the colloid goitre is met with most frequently, and beginning with the fortieth year the nodular goitre is the most common. The authors frequently found colloid in the parenchymatous goitres following the preliminary treatment with iodine. Histological and chemical investigations showed that a deficiency of iodine, in addition to endogenic causes, should be considered an important cause for the development of goitre in adolescents. The insufficient compensatory hypertrophy gives the thyroid in treatment a great advantage over the simple iodine therapy. Operative intervention should follow only mechanical indicatons. The postoperative treatment requires careful iodine or thyroidin treatment in order to avoid recurrences and hypothyroidism.

Goitre.—Robert McCarrison (*British Medical Journal,* June 7, 1924), in his discussion on simple goitre, asserts that there are two main factors on which the prevention and cure of goitre depend: 1, the general hygiene of the individual, and especially of the intestinal tract; and 2, the amount of iodine available for the needs of the thyroid gland and the organism generally. A recognition of the intimate interrelation between them will enable us to deal effectively with most cases of goitre, whether they be sporadic, epidemic, or endemic. It is not always necessary that the water supply should be bacteriologically impure in order that the bacterial conditions in the intestine favorable to the production of goitre shall be set up: constipation and imperfect drainage of the bowel may be equally effective in producing them; and if at the same time the food be poor in iodine, or relatively poor in it in proportion to other constituents, thyroid hyperplasia and goitre will be very prone to occur.

Where the water supply is impure and unprotected from pollution, as it is in endemic areas, the first step in the prevention of goitre should be the provision of a pure and protected water supply. Similarly, the first step in the prevention and care of goitre in the individual should be the establishment of a state of perfect hygiene of the bowel. Where despite these measures goitre arises, then it may be assumed that the intake of iodine in the food and water is insufficient, and the prophylactic use of iodine is indicated, as it is when these measures cannot be applied or as an adjunct to them. The method of prevention of goitre by iodine is simple, rational, and cheap, and consists in the administration of 2.0 grams of sodium iodide, in 0.2 gram doses, distributed over a period of two weeks, and repeated each spring and autumn. It is best given at those periods of life when goitre is most likely to develop, and the call for it is more urgent in the female than in the male sex.

X Ray Treatment of Hyperthyroidism.—C. W. S. Saberton (*British Medical Journal,* April 12, 1924), states that it is not as yet known how the x rays produce their effect and cure hyperthyroidism, but as the function of the gland apparently becomes normal again it is highly probable that, apart from any local action such as thickening of the intima of the bloodvessels and an increase in the fibrous tissue elements of the gland, other changes occur which affect or modify the quality or quantity of the gland secretion. Radiating so vascular an organ as the thyroid may produce changes in the blood serum which may also influence the gland. It seems highly improbable that the radiation can cause myxedema. The author stops the radiation before the heart frequency comes down to normal, as the effect of the radiation is cumulative and continues for some weeks after actual treatment has ceased. Some patients who have still symptoms of hyperthyroidism on completion of their first course of treatment present themselves some few months later without any symptoms of the disease. Radiation treatment was not found to be satisfactory in cases in which symptoms of hyperthyroidism have supervened upon an old large parenchymatous, adenoparenchymatous, or cystic goitre. These cases should be referred to the surgeon, especially if there is pressure on the trachea. If the condition of the patient precludes surgery radiation treatment must be tried, as improvement in the patient's general health sometimes occurs, although the gland is not obviously reduced in size.

The Röntgen Treatment of Toxic Goitre.—E. W. Rowe (*Endocrinology,* May, 1924), pronounces the metabolism test the gauge for treatment in toxic goitre, calling it the quantitative estimation of thyroid function. The object of treatment, he says, is three fold—to reduce the output of thyroxin from the gland, lessen permanently the function, and to conserve the other organs of the body. The cleaning up of all focal infection is essential in every case. The general management is of major importance. The psychic control should be complete. The diet should be nutritious: a glass of milk three or four times a day is desirable. Rest and diet may entirely relieve mild cases, but lose their influence after the first advantage when metabolism is much disturbed.

For effective treatment surgery and the x ray are alone to be considered. It is impossible to compare in a practical manner the percentage of cures by surgery and the röntgen ray. They do not speak the same language. Few are completely cured by surgery. A master in this field has said that a successful operation only begins the treatment. The clinical signs may disappear and the metabolism rate return to normal, but there remains a subnormal individual whose capacity in life is restricted. At the Massachusetts General Hospital in comparing röntgen therapy and surgery it was found that in the third year after treatment the after results were the same. In röntgen therapy the improvement was gradual and progressive, with surgery there was a sudden marked improvement and a subsequent relapse.

The effect of röntgen rays is upon the thyroid gland, producing slow degeneration of the parenchymatous tissue, which is replaced by fibrous tissue. In the hands of an expert the dangers are small. The earlier the treatment, the more prompt the relief. The first improvement is seen in general bodily feelings in three or four weeks. Next will be noticed a fall in the pulse rate; then the weight begins to gain. Nervousness and insomnia improve. In about fifty per cent. the exophthalmos eventually disappears: in most cases it improves. Thyroid enlargement is the last objective sign to go. It is imperative that the one who directs the röntgen treatment should have full charge of the case. The general management of the patient is as important in x ray treatment as in surgery. Many failures occur because some one else directs and the specialist is the technician. The treatment of toxic goitre is major röntgenological work, the author repeats this with emphasis, and demands broad medical experience.

His method is to administer the rays over three areas, both lobes and the thymus. The presence of a more or less persistent thymus in sixty-five per cent. of cases of exophthalmic goitre renders its treatment imperative. The first four treatments are one week apart. In the second and third months they are ten days apart. Then there is usually a period of rest and subsequent administration is determined by the metabolism rate. Eighty kilovolts are used.

a distance of thirty-five centimetres, and an aluminum filter of five millimetres. Massive therapy is never used except in malignancy.

The indications for röntgen treatment are 1, all exophthalmic goitres not at too high a metabolic reading, although x ray treatment may be started cautiously in those much too high for surgery; 2, to prepare for surgery by reducing the activity of the thyroid; 3, after surgical failure; 4, adolescent goitre not responding to rest; 5, adenomatous goitre with toxicity; 6, carcinomatous degeneration accompanied by toxicity after surgical removal. Contraindications are 1, colloid, cystic, and nodular goitre without toxicity; 2, goitre causing marked pressure in the neck without symptoms; 3, intrathoracic goitre.

An Analysis of Types of Goitre with Indications for Treatment.—E. A. Arn (*Endocrinology,* May, 1924) classifies goitres under the heads of, 1, colloid goitre; 2, thyroid adenoma, a, without hyperthyroidism and b, with hyperthyroidism; and 3, Graves's disease. Treatment of colloid goitre includes prevention by the use of boiled water only and by the administration of minute quantities of iodine. The latter may be accomplished, 1, by the use of iodized table salt; 2, by giving thirty grains of iodine each spring and fall; 3, by administering iodine tablets in schools; 4, by the inhalation of iodine; or 5, by administering thyroid gland preparations. Existing goitre may receive treatment with iodine or with animal thyroid extract. Warning is given against the use of any but small doses of iodine. Larger ones may produce rapid symptomatic cure, but almost certainly cause a degeneration of the gland, and repetition often leads to serious consequences. For this degeneration thyroid extracts are the best remedy.

Adenoma of the thyroid is often quiescent many years, then becomes rapidly toxic following acute infection, such as tonsillitis, influenza, and pneumonia, or it may be lighted up by the injudicious use of iodine. Operative interference should be avoided, if possible, and, when imperative, ought to be as conservative as may be. Adenoma with hyperthyroidism is marked by cardiovascular changes, rapid loss of weight, gastrointestinal symptoms, increased metabolism, and increased nervous excitability. Following partial thyroidectomy the metabolic rate rapidly returns to normal and the gain in weight is quite rapid. The results are not so good, if the toxicity has been excited by repeated courses of iodine. Clinically there are two types of exophthalmic goitre, one characterized by chronicity, running an even, usually mild course, and rarely developing a thyroid crisis, the other characterized by fulminating attacks induced by shock, fright, sickness, overwork, acute infections, and other causes. A certain percentage of cases seem to recover without treatment, while others run an acute course and terminate fatally in spite of all treatment. X ray treatment, the author thinks, should never be used except in hyperplastic cases. Surgery must be individualized. Statistics from various clinics indicate that seventy per cent. are cured by surgery, twenty per cent. are improved, and ten per cent. are not benefited or have recurrences.

Conclusions Based on a Study of Four Thousand Cases of Goitre.—Following Engelbach's classification, A. S. Jackson (*Endocrinology,* July, 1924) states some helpful diagnostic points. Ordinary colloid goitre has a soft globular feel and symmetrical enlargement: a normal metabolic rate confirms the diagnosis. Adenomas develop in neglected colloid goitres as a form of compensatory development. One in every four adenomas becomes toxic before the patient reaches fifty years of age. An adenoma is present an average of sixteen years before the onset of toxic symptoms. In adenoma the gland is symmetrically enlarged, and one or more nodular tumors may be palpated: in exophthalmic goitre the gland is enlarged symmetrically. In toxic adenoma acute crises do not occur; thrills and bruits are rare; exophthalmos is not seen, hypertension and a disproportionately high diastolic pressure are the rule; loss in weight and strength, tremor, nervousness, a moist skin, tachycardia, and palpitation occur as in exophthalmic goitre. A history of gradually disappearing goitre, chronic cough, choking spells, difficulty in swallowing, and increasing huskiness of voice is indicative of a substernal or intrathoracic goitre. Malignancy does not occur in cases of exophthalmic goitre. An adenoma is potentially a precursor of cancer and should be removed.

In exophthalmic goitre the onset of hyperthyroidism, unlike that of toxic adenoma, is acute, the average duration of symptoms being nine months. The disease progresses by acute exacerbations and periods of remission. Thrills and bruits occur in eighty per cent of the cases. Bilateral exophthalmos is observed in one of every two patients within three months of onset of symptoms. The pulse pressure is high, a low diastolic pressure being a very important diagnostic point. Muscular asthenia is most marked in the quadriceps group of muscles.

Laryngeal examination before operation will show partial or complete paralysis of one or both cords in one of every fifteen cases. From a mediocolegal point of view this evidence may prove important postoperatively. In exopthalmic goitre Lugol's solution reduces the metabolic rate preoperatively an average of twenty per cent., because of the proportionate clinical improvement the necessity for ligation is thus obviated in seventy-five per cent. of cases. Lugol's solution and ligation are not indicated in the treatment of toxic adenoma. Because of the numerous advantages of the novocain method of local anesthesia the author uses it in ninety per cent. of his cases. When the operation is finished, undetected bleeders may be found by causing the patient to cough and strain.

Influence of Toxemias on Thyroid Gland.—W. S. Bainbridge (*International Journal of Medicine and Surgery,* April 1924) discusses foci of infection of the thyroid and compares thyroid pathological conditions to those which produce abnormal mammary changes, viz., autointoxication. When the toxemia is removed the breasts become normal. In the same way, allowing for the difference in the gland structure, removal of a toxemia which has affected the thyroid may cause complete disappearance of the thyroid condition. He studies in particular the relation of intestinal stasis to thyroidism, and reports a series of case histories to illustrate the point that the thyroid reacts very markedly to toxins from the intestinal canal. In the milder types of thyroidism, and those types of hyperthyroidism which suddenly become acute under fright, nervous strain, etc., the mere removal of intestinal stasis or other toxic condition was sufficient cure. The goitre disappeared without operation or thyroid treatment. In the more severe types of thyroidism a combination, removal of the toxic condition, thyroid treatment, and sometimes operation, was found to effect the desired cure.

Idiosyncrasy to Adrenalin, With Reference to Its Employment with Local Anesthetics and in Goetsch's Test for Hyperthyroidism.—H. E. Symes-Thompson (*Lancet,* April 12, 1924) concludes that some people show toxic effects as a result of receiving a small dose of adrenalin, and that these effects are increased if certain local anesthetics are given simultaneously. Toxic manifestations from adrenalin might be eliminated in dental practice if dentists were to avoid stronger solutions of this drug than 1 in 100,000. Surgeons might escape such manifestations by giving a preliminary injection of a smaller dose of adrenalin than that which it is proposed to employ at the operation; and, in the event of an idiosyncrasy to adrenalin being found to be present, by employing a general anesthetic. It is preferable to use synthetic adrenalin rather than the natural product. The use of adrenalin is contraindicated when operating on patients with exophthalmic goitre. The practicability of using large quantities of a dilute solution of novocain may render it possible to discontinue the use of adrenalin with this local anesthetic. The Goetsch test should only be employed when the diagnosis cannot be established by other means; if it is decided to make the test, a smaller dose should be given first, as suggested in the case of projected surgical operations.

The Pituitary Factor in Menstrual Processes and Its Relationship to the Corpus Lutuem. — J. Hofbauer (*Zentralblatt für Gynäkologie,* January 19, 1924) states that, contrary to the prevailing opinion, the changes in the uterine mucous membrane, maturation of the ovarian follicle, migration of the ovum and the formation of the corpus luteum are not primarily due to the influence of the ovum but to impulses which originate from the pituitary body and the midbrain (the vegetative centre). The albumin of the degenerating ovum acts anaphylactically and therefore menstruation is an anaphylactic phenomenon. The extract of the corpus luteum acts like atropine, inhibits vegetative processes, and regulates the bleeding.

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Medicolegal Notes.

TAXATION OF HOSPITALS—EXEMPTIONS

The Pennsylvania Superior Court, in the Appeal of Children's Hospital of Philadelphia, 82 Pa. Superior Ct. 196, holds that an addition to an existing hospital building while in course of erection and therefore not yet actually used for healing the sick is exempt from taxation under the Act of April 9, 1921, P. L. 119. The court said that while it is well settled in Pennsylvania that the right to exemption of property from taxation is based upon use, the Supreme Court has never held that an addition to a building which was in use as a place of public worship, a hospital or other purely charity is subject to taxation prior to the time when it is actually used for religious or charitable purposes. "While it is the use of a hospital plant which determines its character as a public charity, it would be sticking in the bark to hold that an addition which is being constructed to a building which is in actual use as a purely public charity is not a part of the institution. It is not to be considered independently of the main structure. It will increase its efficiency and facilities."

COMPENSATION FOR INJURIES ARISING OUT OF EMPLOYMENT

The Maine Supreme Judicial Court holds, Pennell v. City of Portland, 125 Atl. 143, that the superintendent of a city hospital was not an "official" of the city within the exception of the Workmen's Compensation Act, since he was subordinate to the overseers, his tenure was uncertain, and he was not required to take an oath or give a bond, and the position he held was not statutory nor established by municipal ordinance. The claimant was held entitled to compensation for injuries received while climbing a ladder to trim trees in the home grounds at the direction of two members of the board, the accident arising out of his employment

ACTION BY PHYSICIAN AGAINST EMPLOYER

In an action by a physician against an employer in which the jury found that the defendant employed the plaintiff to attend its disabled employee, and expressly and unqualifiedly undertook to pay for such services, the Maine Supreme Judicial Court held, Ferren v. S. D. Warren Co., 125 Atl. 392, that under section 10 of the Workmen's Compensation Act the defendant, without contract except as implied from its status as an assenting employer, was bound to furnish, or pay for, medical aid to an extent determinable by the Industrial Accident Commission. But the employer may bind himself by express contract to pay medical bills. Such contract is enforceable through the common-law courts. No Commission decree is necessary to give it binding force. Unless the contract expressly so provides, such decree ca not limit the extent of the obligation. A decree of t Commission in a proceeding by the employee was held i admissible, since it did not effect any obligation arisin from the express contract between the plaintiff and t defendant.

OSTEOPATH HELD AS PHYSICIAN IN CONNECTICUT

In a proceeding under the Connecticut Workmen's Con pensation Act, the single question was whether an osteopat chosen by the claimant to treat his injury, a strained bac causing temporary total incapacity, was a "competent phys ician or surgeon to attend the injured employee" in thi particular case, within the meaning of the Statute. "Eac case," the court said, "is to be determined by its own fact Undoubtedly certain diseases are incapable of treatment b osteopathic methods. The statute, we think, requires bot legal competency and competency in the particular cas On the findings Dr. Andrus was competent in both of thes respects. He was licensed to practise the healing art b the lawful, though limited, methods of osteopathy, and h was competent to treat the claimant in this particula case for the injury in question, and did treat it with suc cess."

It was held in view of Conn. Gen. St. 1918, Nos. 2864, 286 that Dr. Andrus being a licensed "osteopathic physician was a "physician" within the meaning of the Workmen Compensation Act. Towers v. Glider & Levin (Conn.) 12 Atl. 366.

ACUTE DILATATION OF HEART HELD AS ACCIDENT

In a proceeding for the death of a mine employee whos duty required him each night to go down into the mine p and look after the pumps, and whose body was found afte he had climbed a stairway leading ninety feet down to th pumps, a doctor who saw the body and talked with othe employees gave the opinion that death had resulted fro acute dilatation of the heart, superinduced by exertion i climbing up the stairs from the mine pit. The Pennsylvani Supreme Court holds, Watkins vs. Pittsburgh Coal Co., 12 Atl. 461, that, assuming the accuracy of the doctor's opin ion, an award of compensation was warranted. Althoug the sudden death of an employee while doing work whic calls for no unusual physical strain raises no presumptio of an accident, the court holds that rule cannot be invoke where duty requires the performance of an act causing fatal strain to a vital organ. "A claimant," the court sai "is required to show the death was accidental, but not th precise nature of the accident. It clearly appears the de ceased sustained a fall, and this may have caused death b a brain lesion or some other injury; so, in addition to th question of heart strain, the circumstances tend to suppor the finding of an accidental death."

NOTICE TO EMPLOYER BY PHYSICIAN OR HOSPITAL SELECTED BY EMPLOYEE

The Rhode Island Workmen's Compensation Act pro vides that an injured employee shall have the right to selec a physician or hospital and that "the employer shall becom liable to such physician or hospital for the reasonable fee for such treatment," provided written notice is given by th physician or hospital to the employer within seven days afte the beginning of the services. The Rhode Island Supreme Court holds Harding vs. Imperial Printing & Finishin Co., 123 Atl. 81, that, while the employer does not becom directly liable to the physician or hospital unless notice i given and the claim is presented as provided by the act, i was the intention to permit the employee to recover afte he had personally paid for the services.

LOCUM TENENS CONTRACT HELD VALID

The California Court of Appeal holds, Rossiter v. Thompson, 226 Pac. 866, that a contract between physicians under which one is to attend to the other's practice for a specified period for a percentage of the returns, is not illegal If a provision in the contract that the employer "shoul absent himself and abandon his practice" for the term o the contract is void under the California Code sectio 1673, as restraining him from practising a lawful profession it would not invalidate the entire contract, the remainder of the contract being complete in itself, and not dependent upon the objectionable feature.

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Syphilis of the Anus and Rectum

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Syphilis has been recognized and studied throughout the centuries, and many supposed causes have been described, but since Schaudinn and Hoffman in 1905 discovered the Spirocheta pallida much new knowledge has come to us. The infection, beginning locally, soon becomes generalized, with widespread evidences of concentration of the spirocheta in those areas. At the anus and within the rectum these changes may easily be mistaken for other diseases. Tumors of various sizes and ulcers of different degrees of depth when seen at the anus or within the rectum are often confusing, particularly to those who see but few cases of rectal disease and who, perhaps, think hemorrhoids, irritable ulcer, fistula and cancer the only disturbances of this region.

About the anus may be found the same skin syphilides as occur elsewhere, but all eruptions are modified in appearance by the action of the heat and moisture and the rubbing together of the buttock cheeks. The possibility of syphilis as an etiological factor must always be in mind. The discovery of the spirocheta, the Wassermann test, the new organic arsenic compounds, the use of the dark field microscope and the employment of spinal punctures for diagnostic and therapeutic purposes are additions to our knowledge of syphilis, the ultimate effect of which it is at this moment impossible to gauge.

DIAGNOSIS.

Any suspicious lesion should be examined for Spirocheta pallida and a Wassermann reaction sought in the patient's blood and spinal fluid, and be it remembered that a negative result of either or both of these examinations does not assure us that the lesion is not syphilitic. All of the morbid changes of the several stages of syphilis may appear at the anus and rectum and it is therefore vitally important that the examiner wear gloves when exploring these parts.

The definite diagnosis in the early primary stage before the spirochete has spread to the lymphatic system near the primary lesion and before the serological reaction is positive is the one and only time that, taken advantage of, may lead to success; and it is the time for action, instant and effective. This is the time for radical cure if such is possible. An injection of arsphenamine here can put an immediate end to infectivity of the case. A complete sterilization seems possible here, and the suppression of the biological and serological evidence of the disease is possible and possibly probable.

The dark field examination must be routine in every suspicious case, and a careful search made for spirochetes. When the antiseptics are applied, especially mercurials, the finding of these organisms is difficult or almost impossible. Because of this no mercurial dressings, or better still, no antiseptics, should be applied to any lesions until the examination for Spirocheta pallida has been made, and if any have been used, it should be made a routine to irrigate thoroughly with physiological sodium chloride solution and to apply a wet dressing of the solution for twelve hours or more before examining for Spirocheta pallida.

The surface of the lesion is wiped with a cotton sponge to remove superficial organisms. The wound may be rubbed or teased lightly, but one should not cause bleeding; just an oozing that will give serum to transfer to a new clean slide and slip should be produced. Immersion oil is put on both the under surface of the slide and upper surface of the cover. This will give a continuous airless medium from dark field to objective. A focus with fine adjustment should be secured until one gets a dark background with the glistening moving particles in white rings. Then a search for the twisting spirocheta may be instituted.

Syphilitic ulcerations at the anus may heal without deformity, but within the rectum syphilis always permanently incapacitates that organ, sometimes only partially and in other instances completely destroying its function. This deformity of the rectum is augmented by the constant irritation and infection from the feces as they pass.

Some time ago a young woman with a painful ulcer at the anus consulted me. She had suffered from constipation for several years and had frequently used an enema. Her physician had treated the ulcer with local applications and later by operation, but only made conditions worse. A phagadenic chancre was later diagnosed, and subsequent history proved this to be correct. We afterwards found how this woman was probably accidentally infected by using a borrowed fountain syringe. There was nothing unusual in her case except the location of the initial sore, and it is mentioned here because the rec-

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tal expression of syphilis is not a frequent finding and may mislead, because the early ulcers may be mistaken for irritable ulcers and the later ones for tuberculosis or cancerous necrosis. Syphilitic new formations are frequently considered malignant. I also speak of this patient because positive evidences of chancres at the anus or within the rectum are usually evidences of unnatural coitus, but they are not always so, and the possibility of infection by means of toilet articles, a syringe tip, clothes, towels, or a bathing suit, is always to be borne in mind, as also the danger to surgeons of infecting their fingers through cuts or abrasions when examining or operating upon a syphilitic patient.

The same chancres, rashes, ulcers, and new formations may be found about the anus as occur in similar histological structures, in other parts of the body, but their clinical picture is modified by conditions peculiar to this region, because of the superimposed infection by intestinal microorganisms, the constant abrasions of the surface by the feces and the irritation of the intestinal secretions. Syphilis is seen here at all ages, in the inherited or acquired types.

CHANCRE

Chancres on the skin about the anus are dependent upon an abrasion being present at the time of exposure to infection. Within the rectum the mucous membrane may also be directly infected. The abrasion in the skin or mucosa may heal in a few days without any visible scar and later (after one to four weeks), the chancre appears at the same site (Fig. 1).

FIG. 1.—Chancre at the anus with *plaque porcelaine*.

Chancres at the anus occur frequently enough to be always thought of when an ulcer is seen at or about this opening. Its existence in men is almost positive proof of sodomy, but in women it may occur by accidental contact with the male organ or from vaginal discharges. The chancre may occur on the skin near the anus, between the radial folds or on the mucous membrane in the anal canal. On the free skin it resembles in appearance a chancre situated elsewhere, but when located between the radial folds or at the anal border it closely resembles an anal fissure. The differentiation is not easy, especially if seen before induration has developed about its base. It begins as a tiny vesicle accompanied by thickening or infiltration of the skin. Later the blister turns brown, and as the scab separates it leaves a shallow ulcer. The surrounding ring of induration always persists. Chancres, like other ulcerations in this region, vary considerably in the pain they cause, some patients being more sensitive to pain than others. Also the degree of pain of any ulcer depends upon its depth. If the chancre is situated out on the skin, away from the anus, it may cause only slight discomfort, and also if at the anus, provided it involves only the mucous membrane, but if it goes through the mucosa and especially if it involves the musculature, either by ulceration or by the fixative leucocytosis about the ulcer, it is certain to be painful. If the induration surrounds the muscle fibres it immobilizes them and by squeezing the fine nerve fibres produces the same sensation as an exposed filament. The chancre in the young woman referred to above was quite as painful as an irritable ulcer.

Chancre at the anus is more frequently observed than within the rectum. Its clinical course at the anus is the same as chancre elsewhere, and on healing there remains a small bluish white scar which is difficult to find later. For this reason the diagnosis often cannot be made afterwards. In other instances the hard contracting scar may cause stricture (5).

Chancre within the rectum is rarely seen because it may occasion little discomfort, only a slight discharge, and may disappear spontaneously. The ulcer has the usual chancre appearance—round, indurated, with sharp raised edges slightly undermined. If it develops on a prolapsing internal hemorrhoid it may be mistaken for a traumatic ulcer. At times no definite ulcer can be discovered, but rather a diffuse proctitis which is evidenced by the occurrence of diarrhea with bloody, mucous stools.

The enlarged inguinal and sacral glands can always be found and are valuable differential information.

SECONDARY INFECTIÓN

In the secondary stage of syphilis we find two forms of ulceration: 1. The mucous patch. 2. The large ragged ulcer, a sequence of necrosis produced by the strangulation of circulation in the tissue surrounding the syphilides.

MUCOUS PATCH

When syphilitic papules are situated in regions where the skin is constantly warm and moist and subjected to friction or upon mucous membranes, they are more or less modified in their appearance, differing from the lesions found in other regions. In regions where there are opposed skin surfaces such as between the buttocks, around the anus, the inner surface of the upper thigh, the scrotum and upon the vulva, the papules show these changes (Fig. 2). Sometimes the papules appear in such profusion as to cause an erythema which might be mistaken for acute eczema. In a few days the papules break down through maceration and become grayish or yellowish white ulcers, irregular in outline and upon an indurated base. These ulcers may be single or multiple.

If multiple, each ulcer will preserve its form, even though it be close to another. The edges are not undermined and the intervening tissue remains healthy. When the vesicles rupture there is a thin, fetid discharge which keeps the parts wet and macer-

FIG. 2.—Showing the occurrence of mucous patches about the anus.

FIG. 3.—Syphiloma of the rectum, with condylomata lata.

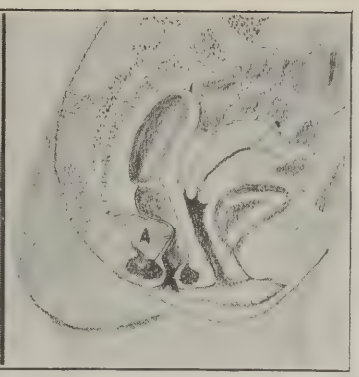

FIG. 5.—Schematic section of pelvis showing the location of the gumma, A.

ated. As the ulcers enlarge they become saucer-shaped, covered with a grayish white membrane, and are termed *plaque porcelaine*. The discharge and moisture of the opposed buttock produce hypertrophy and before the mucous patches are healed there develop broad, flat warts, the condylomata lata (Fig. 3).

Sometimes this hypertrophy is excessive, giving rise to large cauliflowerlike masses of vegetation covered with an extremely offensive secretion (vegetating or papillomatous syphiloderm).

When the mucous patch occurs upon the mucous membrane of the anus or rectum it varies from the size of a pea to that of the little fingernail and looks as if the ulcer had been lightly painted with silver nitrate.

CASE I.—C. 21, aged nineteen. For the past three weeks she had had a constant burning pain in the rectum at the anus, also a bloody discharge. Defecation was painful. On inspection there was found in the right posterior quadrant of the anus a bright red ulcerated area, extending from the anal canal to well out on the skin. A dense infiltration surrounded this ulcer and its edges were raised. There was also a large white area on the side of the right buttock. A macular eruption was found on the patient's upper body. The diagnosis was syphilitic chancre at anus with *plaque porcelaine* on buttock (Fig. 1).

ULCERATIONS SECONDARY TO OTHER SYPHILIDES

When the mucous patch appears there develops surrounding congestion which interferes with the local circulation, and sometimes the tissue sloughs away. This may happen with any syphilitic eruption about these parts, i. e., papular, macular, pustular or the small moist papules that appear at the anal folds, on the inner sides of the thigh, or about the genitals in any case of syphilis regardless of the location of the chancre. The resulting ulcers are gangrenous, gray in color, irregular in outline and ooze blood on slight touch.

There is a tendency to induration of the edges of the ulcer and to extensive stenosis of the rectum. This stage of the disease may frequently be mistaken for tuberculous ulcers, and vice versa. Spirochetæ are present in all these lesions which are therefore sources of infection.

Within the rectum the cellular infiltration and induration produce an edema of the mucous membrane. This swelling increases friction, and necrosis is produced usually in several places. The ulcers are regular in form, circular in outline, with clear edges, and usually the whole trouble is confined to the mucous membrane. If seen early they are amenable to treatment and may heal with little resulting scar.

As has been mentioned above, these ulcers cause few symptoms and therefore often go untreated until they have enlarged both on the surface and in depth, and until they may have extended through the deeper coats of the rectum and even into the pelvic structures. If they are on the anterior wall of the bowel, the peritoneum may be opened and infected; if on the posterior wall, the sacrum may be laid bare. If the patient also suffers from some other systemic disorder such as nephritis, tuberculosis or anemia, the ulcer may spread out almost unlimitedly. Kelsey, quoted by Tuttle, reported a case where the whole rectum was circled. The favorite location for these ulcers is about one inch above the sphincter, but they are found less frequently higher up, even to the colon.

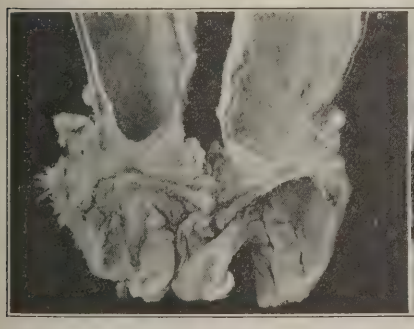

FIG. 7.—Complete stricture (syphilitic) which is annular and resembles cancerous stricture.

FIG. 10.—Congenital syphilis. Showing extensive destruction as a result of ulceration of papules.

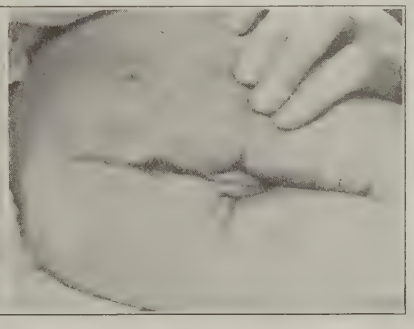

FIG. 11.—The same case of congenital syphilis as that shown in Fig. 10 after antiluetic treatment.

Fig. 4.—X ray photograph of patient in case C 23, showing the location of the gumma, A.

These ulcers are sluggish in appearance, with sodden surrounding tissues, and are usually chronic although not always. Occasionally one is phagedenic for the reasons already assigned. Ulcerating syphilides are likely to be confounded with tuberculous ulcers. Paget in his classical differentiation says they have sharp, well defined edges with level base. This is in contrast to the ragged, undermined and indurated edges of tuberculosis. If several of them coalesce, they appear as one large ulcer, or as a lobulated ulcer, but they do not encircle the bowel as do tuberculous ulcers. On the other hand, if tuberculosis has existed long enough to produce a number of ulcers in or about the rectum, or a large excavating one, we will find tuberculosis in other organs. There is considerable purulent discharge from the tuberculous ulcer. The syphilitic ulceration produces a thickened leathery feel to the bowel, but tuberculosis does not affect the elasticity of the rectum.

At this time the lymphatics are much enlarged and may be mistaken for abscesses or gumma. From these ulcers there is an abundant discharge of greenish pus, tinged with blood, and having a fetid odor, which is characteristic and different from that of carcinoma or the ordinary rectal abscess. Infection of the deep lymphatics may occur and end in abscess and fistula. Such fistula are often unresponsive to surgical treatment unless combined with antisyphilitic medication. If ulceration progresses to this advanced stage stricture of the rectum is inevitable.

Fig. 6a.—Syphilitic stricture showing pencillike calibre and the funnelshaped upper limit.

Fig. 6.—Classical syphilitic pencillike stricture. Lower end of rectum above internal syhincter shows a long smooth contracture of the lumen, without any filling defects showing or any fistulous channels. The picture looks like the pathology produced by a syphilitic process. No ampulla shows at all as canal does not expand enough to form an ampulla. Colon looks normal and shows no defects from sigmoid to cecum.

Late or tertiary changes about the anus and rectum appear as ulcers, gumma and fibrous hyperplasia which arise after all of the earlier evidences have disappeared. Trauma may excite active lesions on the predisposed soil of syphilitic infection.

MacCallum (4) says: "It will be observed in considering the development of the tertiary syphilitic lesions that they often arise in places where there were secondary lesions which had healed, and it has been suggested that they are the effect of the further growth of spirochetæ which had been left behind in the healing of the secondary syphilis. The

FIG. 8.—Syphilitic rectal stricture, which does not have a funnel-shaped upper extremity.

evidence is not entirely convincing in regard to this, although there are many well attested cases in which gummata appeared on the site of secondary lesions."

NODULAR SYPHILODERMA—TUBERCULAR SYPHILODERM

The nodular syphiloderm is characterized by patches of dull red or brownish red elevations varying in size from that of a small to a large pea, with a smooth or slightly scaly surface, usually aggregated in variously sized patches or groups either without definite arrangement or, what is common, arranged in circles or crescents. Although such patches may be annular from the beginning, they also frequently arise through the absorption of the centrally situated lesions, while new nodules are added to the circumference. The nodules may undergo absorption after a month or two, leaving pigmented atrophy of the skin, or they may ulcerate forming patches made up of a number of small round punched out ulcers covered with crusts. These ulcerating patches are often crescentic or reniform in shape, advancing on the convex border and healing on the concave side, or they may form extensive serpiginous figures which ulcerate and crust over, and frequently involve large areas in the course of month or years, producing extreme destruction of the skin followed by scarring of a characteristic kind. There is usually but one such patch upon the body, although there may be several. The nodular syphiloderm is usually seen two or three years after infection, although quite exceptionally it occurs in the late secondary period, when the lesions are likely to be much more numerous than the latter eruption, although never generalized and symmetrical. It commonly occurs ten years or more after the initial lesion.

The course is a chronic one, the patches slowly extending and lasting for years unless removed by treatment. Usually there are no marked subjective symptoms. Even when extensive ulceration occurs, there is little or no pain, but exceptionally there may be severe pain upon movement or when the individual sits or lies down.

Diagnosis.—The nodular syphiloderm is usually recognized without difficulty, the only affection for which it is at all likely to be mistaken being lupus vulgaris. The former is almost always a disease of adults, the latter begins as a rule in childhood; the former frequently shows an annular or crescentic arrangement, the latter infrequently does so; the syphilitic affection spreads rapidly and in a few months is as extensive as lupus is in as many years. When lupus recurs it does so in the midst of the cicatrices, whereas, the nodules of syphilis are found at the margins of the scars.

Gumma.—The gumma is usually a manifestation of the late tertiary stage of syphilis, but it may occur in the late secondary stage or even, very occasionally, in the early secondary stage, when as Hartzell (11) says it is usually regarded as a symptom of socalled precocious syphilis. Gumma occurs quite frequently upon the buttocks and thighs and it may develop in the mucosa of the anus or rectum in the connective tissue of the bowel or of the ischiorectal fossa.

Gumma may be single or multiple, although Johnson (2) says the isolated gumma is rare. It begins as a small firm subcutaneous nodule about the size of an enlarged lymph gland, which, as it enlarges, becomes adherent to the overlying skin which, at first, is of normal color but later becomes red and slightly elevated. It grows rapidly and in the course of a month or two it may be as large as a hen's egg. The skin becomes stretched, bluish in color, and finally gives way, a viscid bloody fluid escaping through the

FIG. 9.—Syphilitic rectal stricture.

opening. Upon palpation the gumma feels like a pea or marble beneath the surface. If the tumor is large it may be mistaken for a myoma.

Case II.—C. 23 presented a large single gumma. This woman, a seamstress, aged forty, had not been able to work for a year because of pain in the rectum. She had daily bowel movements which were streaked with blood or mucus, but the evacuations were not particularly painful. She had not lost weight. On digital examination there was found about two inches above the anus a large, hard, round lobulated tumor about two inches in diameter. It was between the rectum and the coccyx and was firmly fixed. It was not painful and could easily be mapped out. No fluctuating spots were found (Fig. 4). A röntgenogram clearly showed the growth. A clinical diagnosis of gumma was made and under treatment it promptly showed improvement. Fig. 5 is a schematic drawing of Case C. 23 showing the position of the gumma A.

Sometimes the outline is well circumscribed but in other instances an area of diffuse fibrous hyperplasia infiltrates around about, forming a firm, rather ill defined dusky red or bluish plaque.

Softening and caseating necrosis develops in the centre of the gumma and the tumor becomes soft and elastic. Later several round openings appear from which a viscid fluid is discharged. These openings may remain discrete or several of them may fuse into one sharp cut punched out ulcer having considerable depth, sometimes extending down to the deeper tissues, and if untreated the ulcer slowly extends in depth and circumference. Eventually the whole indurated region may break down into a large serpiginous ulcer. If the early openings of a gumma be into the rectum fecal matter may be forced into the pocket and an ischiorectal abscess be formed later. Many fistulæ may thus appear extending out into the skin or invading the bladder or vagina. Occasionally the gumma instead of following the above course will disappear by absorption without ulceration.

The early appearance of the growth closely resembles cancer in that it is nodular and freely movable in the subcutaneous connective tissue. Later when extensive gummatous infiltration and ulceration occurs about the perineum or the female genitalia, the lymphatic circulation may be greatly interfered with and a condition of fibrous thickening with papillomatous growth may arise resembling elephantiasis.

The gumma is usually without pain in its earlier stages, but when the ulceration has occurred there may be constant sharp tearing pain whenever the tissues are subjected to stretching or movement.

The diagnosis of gumma presents little difficulty when seen in the ulcerative stage, its circular shape and punched out appearance, the absence of pain except on movement of the parts and often the presence of old syphilitic scars elsewhere are quite characteristic. In the earlier stages before ulceration has occurred it may be mistaken for fibroma, lipoma, sarcoma or tuberculous gumma, but its comparatively rapid growth is distinctive. When uncertainty exists regarding the differential diagnosis the patient should be given the benefit of a short course of antiluetic treatment before subjecting him to a serious and mutilating operation. The Wassermann reaction may be negative in late syphilis and its presence only proves that the patient is a syphilitic subject and not that the ulcer is of necessity syphilitic.

If the gumma is incised the wound remains unhealed and later becomes surrounded with extensive, dense scar tissue. Finger and Landsteiner (3) have shown that gummata contain living spirochetes which can produce infection in another animal.

The proctitis associated with the ulceration and

Fig. 12.—Syphilitic ulceration at anus.

cellular infiltration occasions a mucopurulent discharge, a feeling of fullness in the rectum and sphincteric tenesmus. When ulceration is marked a deep burning pain is complained of. Each defecation is painful and is usually followed by bleeding.

Fibrous infiltration of the rectal coats without distinct gumma formation but instead a diffusing through all the structures of the bowel, particularly the mucosa and submucosa, sometimes occurs. Multiple syphilitic nodules arise in the mucous membrane, usually just within the rectum proper, and spread upwards sometimes so far as the sigmoid flexure or colon. This is a hyperplastic proctitis, a diffuse and wide infiltration of the whole wall of the gut but especially the submucosa, with mononuclear and epithelioid cells. It soon breaks down into extensive ulcers which may even surround the rectal lumen. A foul discharge is present and defecation is painful. Numerous fistulæ develop, some of which extend widely out on the buttock into the vagina or urethra. Pain and tenesmus are constant because ulceration is extending in one place while cicatrization goes on in another. Alternate constipation and diarrhea occur and the rectum is dilated and hypertrophied above the ulcerated area. Later the dense scar formation about the healing constricts the lumen of the gut and obstruction arises. Although this condition is exhausting the patient usually dies of some other cause for which this chronic poisoning prepares the way.

Case III.—A woman, aged forty-two, married, two children, no history of syphilis. About three years ago she noticed a hardness of the perineal body. The vagina seemed hard and stiff; her physician gave her local treatment without success. When

I saw her she suffered from obstinate constipation which was gradually getting worse, and a tentative diagnosis of carcinoma had been made. On examination the anus was found in its normal position. The skin of the perineum and about the anus was rough and wrinkled, dry and thickened, but not sensitive. On attempting digital examination I found the rectal wall hard, rough and tight about the finger, making introduction painful. The narrow, cylindrical three quarter inch rectoscope was introduced with difficulty. The hardness and fullness of the tissue was greatest at the anus and shaded away for a distance of five inches within the rectum. The examination was painful, and although it stretched the tissues considerably it did not cause any bleeding. A positive Wassermann was obtained.

Syphilitic stricture of the rectum.—Just how frequently syphilis causes stricture of the rectum is a moot question. Some authors assert that all nonmalignant strictures are syphilitic, while others are equally positive that strictures result from any ulcerative changes regardless of its type or etiology. At any rate we do find that syphilitic stricture may follow any syphilitic ulcer as chancre, secondary ulcer, or broken down gumma and that it has certain peculiar characteristics. The Wassermann reaction will, however, help us to decide definitely for or against lues in a given stricture. Clinically, however, it is sometimes impossible to say that a given stricture is or is not syphilitic. Of course, once ulceration occurs and septic infection is added, the picture is so confused that a microscopic examination of a piece of the tissue may be necessary for diagnosis. The chancroid, though not syphilitic, is a close relation and frequently produces a serious form of stricture.

The discharge of blood, mucus or pus of which many syphilitics complain during the secondary stage, is often attributed to the mercuric remedies administered and the probability of the presence of mucous patches or ulcers is forgotten. We do not see stricture patients during the latent or infiltrating stage because they do not consult a physician until they are suffering from stenosis of the rectum.

Histologically we find in the syphilitic stricture a chronic inflammatory formation about the bloodvessels and within their walls. Especially is this found in the arteries. This obliterating endarteritis is the same as found in any syphilitic lesion.

The infiltration and thickening of the mucous membrane about the ulceration or about the minute gummatous deposits in the mucous membrane imparts a stiff, rough, leathery character to the rectal wall and thereby limits and lessens the distensibility of the rectum. A sanious and mucopurulent discharge fills the rectum. Later when the ulcer may have healed the mucous membrane remains dry. The cicatrix is blue white, dense and hard and usually presents some ulceration at its upper extremity. Syphilitic ulcers are inclined to follow the course of the lymph and bloodvessels, and as that direction in the rectum is lengthwise the contracted portion is usually tubular instead of sharply annular as we find in the inflammatory stricture. This condition may extend from the anus to the colon although most syphilitic strictures occur from one to three inches from the anus, the more recent part of the stricture with its infiltration and proliferation is frequently the most obstructive. Ulceration may also be found below the stricture and from these ulcers fistulæ lead to perirectal abscesses or open externally on the skin or into the vagina or urethra.

When decided stricture occurs low in the rectum constipation alternates with diarrhea and the passage of ribbon shaped or broken stools.

Differential diagnosis.—The differentiation of syphilitic from tuberculous, dysenteric or malignant strictures is a most important factor. Syphilitic strictures usually are long, funnel shaped contractions with blue white cicatrices about the ulcers. The edges of the ulcer are never undermined but rather craterlike. In some instances these dense white scars can be plainly seen through the speculum in the tissues of the rectum just below the stricture.

Fig. 6 shows the tightly contracted rectal lumen of a syphilitic stricture.

Case IV.—This woman contracted syphilis seven years ago. For the past year she had had pain in the rectum and a purulent sanious discharge. The bowels were always constipated. On digital examination the finger, at a distance of one and one half inches from the anus, came to a solid impassable stricture. The rectum below the stricture was hard and nodular. The patient had several fistulæ leading into the vagina and others out onto the skin. These were tender as the digital examination was made. The patient had been on intensive antisyphilitic treatment for some time, and, although her general condition had much improved, the obstipation was still a serious matter and an abnormal anus has been advised.

Here is appended the röntgenologist's report of Fig. 6.

Radiological findings.—Lower end of rectum above internal sphincter shows a long smooth contracture of the lumen, without any filling defects showing or any fistulous channels. The picture looks like the pathology produced by a syphilitic process. No ampulla shown at all as canal does not expand enough to form an ampulla. Colon appears normal and shows no defects from sigmoid to cecum.

Not all syphilitic strictures are long and pencillike in character. Sometimes the pathology is limited to a small area and the stricture is more annular in character, as in Fig. 7. Here the differential diagnosis from the physical findings was not possible.

The patient was first seen when acute obstruction had developed and a laparotomy was performed. When the abdomen was opened and the sigmoid was lifted up it was noted that the hyperplasia seemed largely on one side of the bowel. Resection was performed and subsequent microscopical examination showed it was not malignant.

As has already been mentioned some of the obstructive symptoms result from the inflammatory swelling about the ulcers. This infiltration and swelling of the mucosa is not syphilitic but rather a reaction to the local streptococcic infection. As the luetic endarteritis subsides gummatous deposits resolve or the ulcers heal under treatment, the swelling of the mucosa lessens and sometimes the obstruction is relieved.

Case V presents such a condition: About one year ago this woman began to have constant pain, of

a cutting character in the rectum, with rectal tenesmus. Since then she passed blood and pus every day. During this time she lost fifteen pounds in weight. She was twenty-six years old. A positive Wassermann was obtained. She was placed on antisyphilitic medication and immediately began to improve. Her appetite returned. She had formed fecal masses which were evacuated without suffering and she improved in general physical appearance although the radiograph of her rectal stricture was still unchanged.

In this case (Fig. 8) the upper end of the stricture is entirely different from that of Fig. 6. The upper limit of the strictured portion of the rectum ends abruptly and the normal elastic rectum continues. But the distinctly tubular stricture will be noted. Nothing surgical was attempted, the woman improved steadily until she became quite comfortable and finally left our observation.

The irregular outline of the upper end of the stricture is very suggestive of the ragged outline obtained in radiographs of cancer of the rectum.

Case V (Fig. 9) is another syphilitic stricture which might easily be mistaken for a malignant growth because of the ragged appearance of the lower end of the patulous bowel, but on closer observation it will be noted that the irregular outline is that of the coccyx situated directly behind the rectum. This patient, aged twenty-seven, had suffered pain in the left loin for the past six years. For the past year she has had pain in the rectum, quite obstinate constipation and the discharge from the anus of blood and pus. A three plus Wassermann reaction was obtained.

PROGNOSIS

The prognosis in all strictures must be guarded until the patient has been under treatment long enough to weigh the various factors in each case.

The inflammatory tumefaction which is a part of the endarteritis will subside under antisyphilitic treatment. The luetic ulcers also will heal and this may relax the obstruction sufficiently to make the patient comfortable and perhaps relieve the constipation. Such a patient is symptomatically cured.

Where the obstruction results from cicatricial contraction as in Fig. 6, relief is not obtained and an abdominal anus or a resection may be required at any moment as in Fig. 7.

When the stricture is low in the rectum and the fibrosis involves the sphincters, atrophy of those muscles frequently produces fecal incontinence.

CONGENITAL SYPHILIS

Congenital syphilis (infantile or inherited syphilis) presents much the same eruptions and ulcers as the acquired form, with the absence of the initial chancre and the several lesions are not in the usual orderly stages. Hartzell says: "The type of eruption is more or less influenced by the period at which infection has taken place, i. e., whether it has occurred at the moment of conception or at an earlier or late period of the pregnancy. The later in the pregnancy the infection takes place, the more nearly the eruptions approach in type those of acquired syphilis. About the anus of a young infant the skin changes are more hypermic and less infiltrated than those of the adult and may be overlooked or mistaken for a simple skin irritation due to uncleanliness.

The earliest manifestation of syphilis in babies is an erythema or macular dermatitis accompanied by shallow fissures about the anus. This often appears about the third week but may appear the first week or be delayed as late as the sixth or eighth week. The red patches, varying in size from that of a pea to a fingernail, gradually become brownish red or copper color, and do not wholly disappear under pressure, owing to the presence of slight pigmentation. There is a slight degree of infiltration which produces thickening and elevation of the skin and a tendency to slight scaling.

The anal mucous membrane is fragile and brittle and shallow fissures are easily produced by dilating the anus. These fissures soon become infected and emit a thin seropurulent, and very fetid discharge. At times these little fissures extend up into the anal canal. As these ulcers heal they leave radiating scars (socalled rhagades).

About the anus, on the scrotum and thighs moist papules or flat condylomata may be found. Frequently these ulcerate, sometimes very deeply, and extensive destruction may result (Figs. 10 and 11).

All of these changes may occur within the first few months of life and may be mistaken for the chafing that results from contact with feces and urine, but the latter condition is never associated with the numerous small shallow anal fissures found in syphilis.

SYPHILIS OF NERVOUS SYSTEM

Syphilis of the central nervous system (tabes) may be evidenced early by a deficient sphincteric innervation. This relaxation of the sphincter muscle may be evident before the knee jerk is lost. Whenever on digital examination of the rectum the sphincter fails to squeeze down tight on the finger and if no evidence of trauma is found always think of syphilis. The anus may even remain patent a moment or two after withdrawing the examining finger.

TRAUMA AND LATENT SYPHILIS

Latent syphilis may in cases play an important rôle as a factor in the immediate and late consequences of trauma. In a normal patient a minor injury or surgical operation on or about the rectum usually heals by primary union although moisture, warmth and hordes of bacteria are always present, and the wound is covered with feces at each defecation. It is not definitely known why syphilitic lesions are likely to appear at the site of trauma, but it would appear as if the body tissues, continually in contact with certain bacterial flora, develop an amount of local resistance which enables them to exist unharmed. Thus ordinarily the mucosa of the lower bowel may be scratched by bits of sharp waste matter, may be irritated by acid stools, may be subject to the ordinary trauma, incidental to defecation, with little consequence. In a syphilitic, however, this barrier of local resistance is broken and the reparative processes are in abeyance. As a result we have a series of rectal conditions, ulcers, fissures, abscesses, fistulæ and proctitis, not truly luetic but engrafted on a syphilitic constitution.

Also the infliction of trauma may produce a *locus minoris resistentiæ* and serve to activate dormant spirochetes. This view is sustained by the following observations. Warthin has demonstrated the spirochete in many organs of latent syphilitics coming to

necropsy. Spirochæta pallida has been found in atrophic and pigmentary remains of syphilides long after their involution. These organs may be found in the scar of chancre long after the sore has healed. Neisser found spirochetes in the skin of syphilitic patients in which there was no local tissue reaction.

Before the spirochete had been discovered, Neumann (6) recorded the persistence of perivascular cell infiltration of the papillary bloodvessels long after the disappearance of the syphilitic papules.

Spirochetes from the blood may be deposited at the site traumatized. Although it is exceptional for these organisms to be recovered from the blood of patients with tertiary syphilis, cases have been reported in which the organisms were demonstrated in such instances. Uhlenhuth and Mulzer (7) report such findings.

(To be concluded)

The Possibility of Immunization of the Tissues of the Nose, Throat and Ear by the Use of Vaccines Applied Locally

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New York

During the summer months of 1924, I had the matter of local immunization of tissues brought to my attention. Credit should be given to Dr. Walter M. Kraus for supplying me with the French literature and vaccines. Professor A. Besredka of the Pasteur Institute had recently made known his results in the prevention of typhoid fever. His experiments prove conclusively that typhoid vaccine can be administered by mouth and give an immunization which will last for a considerable length of time. It is impossible to go into the details of Professor Besredka's experiments here. Suffice it to say that he gave the vaccine to thousands of persons who were exposed to typhoid fever and who refused to take the hypodermic inoculations and was able to avoid the spread of the disease. Besredka observed that the intestinal mucosa would take hold of the vaccine better if there was first an ingestion of bile. Therefore the person given the vaccine takes a preparation of bile one hour before breakfast each morning and then takes a tablet of desiccated killed typhoid bacteria a half hour later. This will give an immunization for a year.

After I had taken this vaccine myself and had read the literature, the possibilities of using vaccines locally on the tissues of the nose, throat and ear immediately presented itself. Nothing could be simpler than making up a large mass vaccine, with no attempt to isolate special bacteria, and applying it locally to the tissues. Such a vaccine not only would conform to the vaccine used by Besredka but at the same time there was every possibility that the broth in which the bacteria grew, would develop some bacteriophage.

After the first few cultures were made, it was deemed wise to isolate the bacteria by spreading them on blood plates in order to check up on the predominating bacteria found in nose, throat and ear infections. Over two hundred vaccines have been prepared during the last few months. In the majority of them the streptococcus (one of several varieties which, often, could not be differentiated in broth cultures) was found either in association with the staphylococcus aureus or the micrococcus catarrhalis. This, by no means, indicates that these are the only bacteria found in these infections but that these bacteria predominate the growth in broth culture.

The method of obtaining the vaccine is simple. A culture is taken from the desired part. If the culture is to be taken from the nose, the sterile swab should be inserted far back or high up in the middle turbinate region. It is immediately sent to the laboratory, where it is placed in a sugar bouillon and allowed to grow for forty-eight hours. The culture is then sterilized to the right temperature and put in a four ounce bottle. A few drops of tricresol solution are added to keep it from contamination.

METHOD OF APPLICATION

For the local immunization of tissues of the nose, throat or ear, the method will vary according to the part to be treated but the object in all cases is to place it as near the seat of infection as possible. Besredka reports many cases of osteomyelitis which have been cured by making a vaccine and applying it as a wet dressing over the diseased part. I had one case (in the service of a surgeon who was a friend of mine) in which there was severe osteomyelitis of the bones of the hand. A vaccine was prepared (streptococcus) and used as a wet dressing. Within a short time the infection cleared up although it had been going on for months.

For infection in the nose, the method of application is as follows: the nose is thoroughly cleaned out by means of alkaline sprays and douches. To the cleaned mucosa the vaccine is applied on thin strips of gauze or flattened cotton which are allowed to remain in the nose for one half to one hour. This treatment is given twice a week for four weeks. In the intervals between treatments, the patient is given some of the vaccine to use in the nose, either spraying it in or using a few drops of it twice a day with a medicine dropper. This is continued until the entire four ounces of vaccine is disposed of. In antral infections, the vaccine is placed in the antrum at one sitting through the puncture opening. For ethmoid infections (and this includes the cases of asthma) the vaccine should be placed high up against the ethmoidal cells (the Dowling tamponade).

For tonsillar or nasopharyngeal infections, it is best to place the vaccine as far back in the posterior

nares as possible. The assumption is that the absorption of the vaccines is through the lymphatics.

For conditions within the auditory canal, the vaccine is dropped into the canal and allowed to remain there for one half hour. The treatment may be given at home twice a day. For the slow healing mastoid wounds, the vaccine is dropped into the mastoid cavity at each dressing or may be applied as a wet dressing to the entire wound.

TYPES OF CASES TREATED

The types of cases which have been treated include the majority of the infections of the nose, throat and ear. Chief among these were infections of the nasal sinuses, especially ethmoiditis. There were three cases of asthma associated with an infection of the ethmoid cells. The ear cases include furunculosis, eczema of the ear canal, chronic suppuration from the ears and five cases of slowly healing mastoid wounds which ordinarily would have been Dakinized.

RESULTS

As we stated previously, about two hundred vaccines have been prepared and well over one hundred administered. In an analysis of one hundred and thirty-six cases, in a variety of nose, throat and ear conditions, ninety-five have shown a great improvement or cure. There have been only six absolute failures and these were in cases of ethmoiditis in which the pathology was sufficient to warrant operation. The author is not in a position to state the beneficial effects of the vaccine in cases of progressive deafness but he feels that an application of the vaccine to the eustachian tube on an applicator which can progress to the middle ear, will possibly result in an improvement of the condition of the tubal mucosa. The majority of cases for which a vaccine was prepared were cases of sinus infection, mainly of the ethmoid cells. If the vaccine is placed in the proper position—that is, high up in the ethmoid region, the results are most gratifying. But the type of case in which most striking results can be seen is in the child who is suffering from so-called repeated colds in the head during the winter months with a discharge of large amounts of mucopus. Almost all of these cases have responded to treatment and this is particularly interesting because these children will not submit to hypodermic administrations.

CONCLUSIONS

1. Reports of the local administration of vaccines for other conditions, such as typhoid fever, have conclusively proved that they will render an immunity.
2. The preparation of the vaccine is extremely simple.
3. The vaccine can be administered without any difficulty directly on the part of the nose, throat or ear which is infected.
4. The broth in which the vaccine grows possibly develops a bacteriophage which augments the effects of the vaccine.
5. Certain definite results have been seen in those infections which do not respond to ordinary antiseptics.
6. The local vaccine can be used on many patients who will not submit to the hypodermic injections of vaccines as usually given.

22 West Seventy-fourth Street.

Trigeminal Neuralgia

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Typical trigeminal neuralgia is one of the easiest conditions to diagnose. Sharp, lightning, lancinating pain, coming on in paroxysms and referred to the peripheral distribution of the trigeminal nerve, the alæ of the nose, the upper and lower lips and the tongue are characteristic. The pain is stabbing, excruciating, unbearable, one of the most severe to which we are exposed. Movement of the face, touching the area supplied by the fifth nerve, hot or cold food in the mouth, a draft of cold air on the face, a sudden noise, is sufficient to cause a stab of pain when the sufferer is in the grip of an attack. In severe cases, fear of the pain prevents eating, washing the face, shaving or even talking, the poor unfortunate sitting perfectly still without moving a muscle lest a spasm result. These attacks come suddenly, causelessly, like a bolt from the blue, last for a time and then cease as abruptly as they began. Such an attack may last from a day to two or three weeks. In the interval there may be complete freedom from pain and the sufferer may be deceived into believing that his troubles are ended. But the pain almost inevitably recurs, the second and succeeding attacks being rather more severe than the first.

Three things are typical of the pain of trigeminal neuralgia. It is paroxysmal, epileptiform. It is referred to the skin surface in the peripheral distribution of the trigeminal nerve. The pain runs parallel to the nerve fibres and the lower jaw and does not run upwards or downwards across the three divisions of the trigeminus. With these three facts in mind it is fairly simple to distinguish between true trigeminal neuralgia of the major type and other pain in the face which may simulate it.

Trigeminal neuralgia is a disease of later life; its occurrence in patients below the age of thirty-five is rare. Males and females alike are afflicted. The incidence of one side of the face over the other is so slight as to be negligible. The second or third divisions are usually involved, the third more commonly than the second, the first more rarely so. If the pain occurs in two divisions, the combination most frequently encountered is the second and third.

The pain may be distributed in all three divisions at the same time. At present there are only two effectual methods of treating tic douloureux—alcohol injection into one or the other of the three divisions of the nerve depending on the distribution of the pain, and section of the sensory root of the trigeminal nerve behind the Gasserian ganglion. All other methods of treatment have been rightly abandoned. Drug therapy is useless. Curiously enough even morphine in large doses is of but little avail in relieving the pain in a major attack. If a patient suspected of having trigeminal neuralgia has become a morphine addict this fact alone should make us wary of confirming the diagnosis of tic without careful consideration. Injection of alcohol into or avulsion of the infraorbital and interior dental nerves has been replaced by direct injection of the second or third divisions at a point as close as possible to their exit from the base of the skull. The deep injections, when successful, are more permanent in their effects than peripheral injection or avulsion. The possibly bad cosmetic result of an operative scar about the face is avoided. In the case of pain in the first or supraorbital division, however, neither of these objections hold. It is not possible to perform a deep injection on the supraorbital nerve. Alcohol may easily be injected into the supraorbital foramen almost by sense of touch. Peripheral avulsion after operative exposure of the nerve is the procedure of choice in supraorbital neuralgia, for the scar in this procedure lies in the eyebrow and is entirely invisible.

Deep alcoholic injections are of much value from a diagnostic point of view. In any case in which the onset or character of the pain is not typical, alcoholic injection of the division in which the pain exists will determine whether or not the pain is due to actual involvement of the fifth nerve or lies outside the trigeminus. If alcohol injection produces peripheral anesthesia in the division attacked and if with the appearance of the peripheral anesthesia the pain in that area is relieved, then true major trigeminal neuralgia exists and avulsion of the sensory root will permanently relieve the suffering. But if following a successful deep injection of the second or third division, as shown by the peripheral anesthesia produced, the pain continues, then the pain is due to factors outside of the trigeminal and surgical measures to cut the sensory root are absolutely contraindicated. It is only by extremely careful sifting and separation of the cases in this way that failure to relieve the pain following reganglionic severance of the sensory root may be avoided. There is nothing that discredits a surgical procedure more quickly than its improper application. The operation is so certain to cure permanently if used only in the cases of major neuralgia that great caution must be exercised lest it be used haphazard for any painful condition referred to the nerve.

During the past four years, through the kindness of Dr. Charles H. Frazier, seventy-seven patients, in which a diagnosis of typical major trigeminal neuralgia had been made, have passed under my personal supervision. Of these, forty-one were males, thirty-six females. Sixty-one of these sufferers were over forty years old, forty-four of them had passed sixty. (See Table I.)

TABLE I: AGE INCIDENCE

Age of patients:	*Number of patients:*
20-30	7
31-40	10
41-50	9
51-60	16
61-70	27
71-80	6
80-+	2
Average age: 54.1 years.	77 total patients. (males 41, females 36.)

In thirty-five cases the right trigeminal tract was involved, in forty-two cases the left. The second and third divisions alone or in combination were most commonly involved (Table II.).

TABLE II.

Division involved:	*Number of cases:*
I, alone	3
II, "	26
III, "	24
I, II, III, conjointly	1
II, III, "	19
I, III, "	0
I, II, "	4
	77

In fifty-one cases either the patients decided first to try the effect of alcoholic injection rather than operation, or we advised injection for diagnostic purposes in cases in which we had cause to doubt the certainty with which a diagnosis of major trigeminal neuralgia could be made. The technic of alcoholic injection of the various divisions, we have described elsewhere (1). In all seventy-seven injections were performed in these fifty-one cases. The third division was injected thirty-five times, the second division thirty-seven times and the first on five occasions. Alcoholic injection of the third division was successful in twenty-four cases, or 84.6 per cent. The second division injections proved for us more difficult, relief of pain being experienced in sixty-five per cent. of the attempts. The five injections of the first division proved effective. Out of seventy-seven injections of the three divisions, fifty-seven or seventy-five per cent., were attended with success. In twenty-five per cent. of cases, failure to hit the nerve involved and relief of the pain was recorded. There were no significant complications following injection with alcohol. In the four cases in which, judging from the extent of the anesthesia produced, the alcohol passed from the third division up into the ganglion no case of keratitis resulted. In eleven cases, eight following third, and three following second division injection, a herpetic eruption in the distribution of the nerve involved was noted for a day or two. In a single case of second division injection an external rectus paresis appeared, but cleared up within two weeks. Following the first alcohol injection the average relief of pain was fourteen months. Three patients have been pain free for over two years. On the average, subsequent to a second injection, the pain was checked for a period of eight and one half months; after a third injection, for five months.

Sufferers from trigeminal neuralgia who come to

us for advice are told that there are only two methods of treatment—injections of absolute alcohol into the divisions of the nerve, or avulsion of the sensory root. They are told that the injections are painful, usually, but not always successful, and transient in their effect. It is explained to them that operation and avulsion of the sensory root permanently relieves the pain, involves the administration of a general anesthesia, is somewhat more dangerous and in about ten per cent. of cases is followed by trophic keratitis in the eye of the side involved. Nearly all patients decide to have an injection at first. We approve of this for two reasons; first, because if successful in relieving the pain, operation later is certain to cure, and secondly, the patient becomes accustomed to the numb sensation in the face and will not complain of paresthesias following section of the root. It is not uncommon for us to perform as many as three injections in a period of about twenty-four months upon the same patient before the recurring attacks of pain bring it home that the alcohol injections are only palliative. After three recurrences the sufferers return with their hope for spontaneous recovery shattered and their morale broken, realizing that for unfailing relief we must resort to operation and begging for immediate surgical interference.

Since Spiller suggested that section of the sensory root behind the ganglion was the operative procedure of choice in the treatment of trifacial neuralgia, two refinements in technic, both suggested by Frazier, have appeared. The first of these is the preservation of the motor root of the trigeminus. As a result atrophy of the temporal muscle which may produce a bad cosmetic effect is avoided. On opening the mouth the jaw drops in the midline and does not deviate to one side. Secondly, in view of the incidence of corneal complications, in cases in which the pain has been referred to the second and third divisions only, he advises that the inner and upper fasciculus of the sensory root be left intact as this sends fibres to the first division which nourishes the cornea. In this way the nerve supply of the cornea is not wholly ablated and trophic keratitis is prevented. While it is not always possible to carry out these two steps an attempt should always be made to do so. A good exposure of the root and a little care in avulsing it fibre by fibre rather than piecemeal has shown that both structures may easily be avoided and left in situ. The motor root lies behind the sensory and is a separate and distinct bundle of fibres. The use of an electrode and observation of the result of stimulation of this fibre on the muscles it supplies, enables us to identify it beyond peradventure. In those subjects in whom the motor root has been preserved we have never seen any difference in the usual total anesthesia of the face which is customary after the complete removal of both roots. Apparently the motor root is purely motor and carries no sensory fibres.

It is not only in the relief of pain from major trigeminal neuralgia that alcoholic injections into the branches of this nerve or avulsion of its sensory root are useful. In malignant conditions of the jaws, cheeks and tongue which by involvement of the fifth nerve fibres at times cause severe, constant pain, relief may be obtained through blocking these fibres by one of the methods described. Our results with these cases will shortly be published.

In a series of twenty-six cases operated in for relief of trigeminal neuralgia the sensory root was severed behind the ganglion in all but two instances. There were no deaths in this series. Both roots were removed in thirteen instances, all but five cases being operated upon before we were attempting to preserve the motor root. In eleven more recent procedures the motor root was successfully preserved and in five of these the inner fasciculus of the root was left behind. In two cases intracranial neurectomy of the second and third divisions was carried out and the ganglion injected at sight with absolute alcohol. Both of these patients were elderly, sixty-eight and seventy-two years of age respectively, one showed glycosuria, and were poor operative risks. It is an easier, more rapid, and apparently almost as effectual a procedure to cut the nerves and inject the ganglion as it is to avulse the root. The relief from pain is not permanent as when the root is avulsed, but if the expectation of life is not long, and the subject in poor condition, the quickest operation which is at the same time adequate is preferable. We have used local anesthesia five times for this procedure, injecting the ganglion with a two per cent. solution of novocaine before manipulating it. The use of local anesthesia does not lend itself particularly well to careful dissection of the motor root and inner fasciculus. A heavy dose of morphine and scopolamine plus local anesthesia and then the administration of ether after the middle meningeal artery has been secured is the most satisfactory combination. In our last eight cases in which we avulsed the sensory root each patient received less than three ounces of ether. Once the root is cut the anesthesia is stopped for the operative field is within the distribution of the fifth nerve.

Twenty-four of the twenty-six patients obtained immediate and complete relief from their suffering. In two instances although the peripheral anesthesia was complete burning pain of a different type from that for which relief was sought and a sense of formication in the anesthetic area were noted. These two patients felt that they were but little improved by the operation. One of them had been apparently completely relieved by alcohol injection of the second division before operation. Too great care cannot be exercised in deciding upon radical treatment. Any atypical feature must be investigated and given scrupulous consideration. Even after experience with these borderline cases the pleadings of the sufferer for relief may lead to unwise surgical decisions.

The most serious common postoperative complication is trophic keratitis. In eight of these twenty-six cases this disturbance occurred. Three healed promptly in twelve hours on closure of the eyelid with courtplaster and did not reappear. Rapid healing of the keratitis following lid closure usually occurs. Six corneas remained ulcerated for forty-eight hours after temporary closure of the lids so that the eyelids were sutured. The ulcer healed and disappeared after the eye had been kept shut for two weeks. Another required four months of closure while the remaining case has the lid still

sutured eight months after avulsion of the root. None of those cases in which the inner and upper fasciculus of the root was saved showed any corneal complications. In any event whether or not corneal complications appear the patient should wear a protective goggle over the eye involved for six months. He should be told that the cornea is insensitive, that no irritant applications should ever be used on it under any consideration and that he should bathe it morning and evening with a warm boric acid solution for at least a year following operation. Two cases of transient paralysis of the frontalis muscle were noted, due probably to pull in the lower angle of the incision on the upper branch of the facial nerve. One patient had complete seventh nerve paralysis of the central type following avulsion of the root. This condition is slowly recovering. The most serious complication we have encountered was a case of external rectus paralysis. In an early case complicated by bleeding, in which speed was essential due to the patient's condition, the abducens nerve was avulsed with the sensory root of the trigeminus. This was due solely and simply to bad surgical technic and should not be held against the method of operation. It merely emphasizes the fact that this is a procedure which should only be carried out by those who have had wide experience with it.

There is a no more grateful class of patients to deal with than those who have been relieved from the torture of trigeminal neuralgia. Even those who have had to have the eyelids sutured—and if this is done skilfully, binocular vision is still possible—have expressed a willingness even to lose the eye if we can assure them that the pain has been relieved permanently. Freedom from pain and the dread of another paroxysm means everything to them. And this we guarantee absolutely that once the sensory root is severed behind the Gasserian ganglion all chance of a recurrence of their agony is gone.

SUMMARY

Trigeminal neuralgia is a condition of later life. The pain is epileptiform, lancinating and referred to the surface of the skin and mucous membrane supplied by the peripheral branches of the trigeminal nerve. The pain spasms follow a course parallel to the lower jaw and never run across the pathways of the three main trunks of the nerve. The second and third divisions are most commonly involved.

Injection of alcohol into the division involved or severing the sensory root behind the Gasserian ganglion is the only effective treatment.

Seventy-seven injections were performed on fifty-one patients with successful results in seventy-five per cent. of cases. The average period of relief following the first injection was fourteen months.

Twenty-six cases requested permanent relief through operative measures. Twenty-four were rendered completely pain-free. Two cases while the anesthesia over the trigeminal area is complete still complain of pain. Operation in these cases was a mistake as the patients were not suffering from true tic douloureux.

There were no operative deaths in this series.

REFERENCE

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Accidentally Removed Nasal Mucous Membrane Adheres and Functions When Replaced

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The following case is reported as one with an unusual outcome.

Case.—The patient was a male, clerk, thirty years of age, with a negative history, except for obstructed nasal breathing. On examination, a large spur on the septum was found, lying low on the right side. In view of a moderate resulting catarrh and slight tinnitus in both ears, the removal of the spur was recommended—apparently a simple operation under novocaine anesthesia. The mucous membrane was found adherent to the underlying cartilage and bone comprising the septum.

When the separation of the mucous membrane had been completed and the cartilage was removed, by accident the entire quadrangle of mucous membrane was torn away and removed also. This square piece, rather more than a centimetre on each edge, was undamaged except for a point where it was torn loose posteriorly. It was immediately placed in warm saline solution. The removal of the hard parts having been completed, an attempt was made to replace the curtain of mucous membrane unfortunately removed. Being lightly dried with gauze, the piece was set as nearly as possible in its original position. A Bernays sponge was introduced, followed by a second one. This plug was immediately moistened with saline solution, and, as it expanded, held the loose piece of mucous membrane in position. To my surprise, the next day when the sponges were gently removed, the replaced mucous membrane had adhered to its original position, its inner surface apparently fast to the inner surface of the mucous membrane unhurt on the opposite side. There was no hemorrhage.

The patient was seen daily for a week, the membrane remaining in place and having a good color. At the end of a month, the membrane continued to look normal and appeared to be functioning.

The effort to replace the membrane was made because of the large denuded area, fearing a subsequent atrophic rhinitis and ozena. That it was successful may suggest similar procedures in cases of a similar accident.

50 East Sixty-third Street.

Home Postgraduate Work by Means of Postmortem Examinations*

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One of the slogans which came out in 1892, at the time of the Columbian Exposition, went something like this: "All roads lead to the World's Fair." There should be a similar slogan in medicine, which should read: "All roads in medicine lead to, or emanate from, the postmortem table."

We call ourselves clinical pathologists and have really come to neglect the study of pathology itself. Strictly speaking, we are not as much clinical pathologists as are the internists, for the word "clinical" means bedside, so it is hard to see how an internist can escape from being a clinical pathologist.

The science of medicine is like all other sciences—if a man devotes all of his time to the study of one part, he becomes more or less lopsided and unable to draw reasonable conclusions from the facts presented before him. So, if we expect to serve the one particular field of pathology, we need to know some clinical medicine. If the clinician desires to serve his field well, he must know some pathology. A common meeting ground, where the various facts can be exchanged regarding all branches of the work, is at the postmortem table. The pathologist, by meeting with the clinician and occasionally seeing the patient, has a chance to keep his clinical knowledge in a serviceable state; likewise, the clinician can gain enough pathology by associating with the pathologist and following his cases at the postmortem table, to make pathology of some service to him. But how to bring about this condition in private practice is the problem that confronts us. Just who shall take the lead in carrying out such a program is a little difficult to determine, but it seems that so long as the pathologist is interested in pathology, he should be the one to undertake to organize and carry out such a program. If the pathologist only does such postmortem examination that he is asked to do that come from private practice, he will not do very many. Speaking from personal experience, the number thus obtained is not sufficient to keep one's knowledge of pathology in a real usable condition.

The clinician does a great deal of work in the free clinics in order that he may have cases upon which to study and experiment, but for the pathologist there is no such field. If we could afford to give a year or more of time when we served as interns to the acquiring of some experience in pathology, we might be able to continue to devote some time to it in the years when we are engaged in active practice. It is true that this is not a field in which to look for a large financial return at present, but it is a very good field in which to continue our education. It has been my experience that in private practice when some very unusual case ended fatally, the physician in charge was usually able to obtain a postmortem examination, but under such circumstances, unless the pathologist is up to date (and he can only keep so by doing postmortems), a good deal of information the case contained could easily be missed.

*Read before the Texas State Pathological Society, San Antonio, Texas, April 28, 1924.

It is the general custom now for nearly all bodies to be embalmed, and to do this, undertaking parlors have to be equipped with good operating rooms, and these same operating rooms furnish a convenient place for doing postmortems. If a way could be found of getting more postmortems, especially from private practice cases, material would be available for carrying on a system of study as suggested above. This idea was advocated in a paper read before the Texas State Association last year when it was suggested that a group of physicians with a pathologist could be organized for this purpose, and an attempt was made to put this idea into effect.

We have, in our community, several physicians who at various times have expressed a desire to have some sort of an institution by which more intensive study might be carried on than was being done. Some of these men were approached with the idea of organizing a group for the purpose of getting postmortems of the patients who died and use the material for study. Those approached were all deeply interested and agreed to try the plan, so an organization was formed consisting of about a dozen members. A group of this size is about as large as can work around a body and see what is going on and it is also about as large a group as can meet together for close study. When the work was started, we felt that if we could get fifty posts in a year that the work could be classed as a great success. We really did not get under way until September but up to the present time we have done approximately one hundred postmortems, and most of these have been done in the last six months.

In the organization of the group, no definite iron-clad rules were made, and the plan has been to have it just as free as possible. No officers have been elected. The pathologist acts as director and the others help in any way that they can. One collects the dues and pays the bills; another looks after the instruments; another takes the responsibility of notifying the men when there is to be an examination, and so on. There is a time agreed upon for regular meetings to review the material, and the postmortems in general are arranged at some convenient hour. As it is often necessary to hurry at that time, only brief histories are given but at the regular meetings, a more detailed history is given of the important cases, the literature is reviewed on the case under discussion, and every detail is brought out, including diagnosis and treatment.

A projecting outfit has also been secured and slides of the important lesions are projected on the screen. This is much more satisfactory than trying to demonstrate with a microscope, as that is time consuming and unless the person conducting the work looks at the microscope quite frequently to see that the slide has not moved, he does not know what is in the field, and one man may see one thing and another man something else. The members are greatly interested in the microscopic preparations as projected on the screen and seem to get a great deal from this fea-

ture. There has been fine cooperation among the members and they have helped the pathologist in every way possible. As soon as they became accustomed to the work various men were taught the technic of doing a postmortem, and now any one of them can do very well by himself if necessary. By getting into the work and actually doing it one sees a great deal more than he otherwise would and he also learns to observe for himself. This I believe is of great value to any one who is trying to do good medical work.

The cases examined so far have been greatly varied in character and of unusual interest. Taken as a whole, the material is far better than any I had a chance to see in hospitals. The examinations for the most part are done at the undertaker's rooms and the undertakers have been very courteous and helpful. Occasionally we have done a postmortem in a private home, but this is difficult and, at times, disagreeable.

The best specimens are saved and a museum has been started, and as the material accumulates, we hope to have something of real value to the community. Many of the specimens so far accumulated have been used to good advantage at the county society meetings. When a sufficient amount of material has been accumulated and classified, it will be useful to illustrate any sort of paper that one may wish to read before the society.

In reading books and journals we study about medicine, but when one follows his own clinical cases, he is studying real medicine, and there is no better way to study medicine than for a man to keep good records of his cases and when the patients die to follow with a postmortem. In our regular meetings, the discussion has been very free and open and to the point. At times, good work has been commended; at other times, weak spots in histories have been developed, and it has been shown why it is necessary that careful and accurate records be kept. This in turn brings out the fact that to make such records, one must learn to observe carefully and correctly.

As to the manner of getting postmortems, if one is interested in the work and asks with the hope of getting something, he usually gets it. Just how the men succeed in getting permissions, I do not know, but nearly all of them meet with great success, and I believe it is simply a matter of taking people into your confidence and telling them what you want. One of the members who has been somewhat timid in asking permission for the making of postmortem examinations was once told by the family after the funeral of one of his patients, that they were sorry an examination had not been made, and the doctor felt deeply humiliated that he had not asked permission for such examination.

From the amount of material we have had to work with, it is evident that it is our own fault if we do not get the opportunity to do more postmortems, for if we make an effort we can have all the material we can use.

We have kept records of our cases but they are not as complete as we would like to have them. Many of the cases have been worked up microscopically, but with so much material at hand, it is impossible to work it all over in detail. The work is still very new; as we get it organized better, and as the various members learn to help more, we believe that much better and more useful work can be done. While it takes a good deal of time and energy, it is well worth our while, and I do not hesitate to recommend it to anyone who cares really to study medicine. If the clinicians follow their cases in this way, they cannot fail to become better diagnosticians, and it goes without saying that the pathologists cannot fail to become better pathologists by thus cooperating with the clinicians.

Otitic Pyemia Without Sinus Thrombosis

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Otitic pyemia usually starts with the entrance of infection by way of the lymph vessels. It may also originate by direct infection either through a dehiscence or necrosis of the tympanic floor. In this case the pyemia evidently followed an acute otitis media, which terminated in a mastoiditis. The subsequent clinical picture and complications were that of sinus thrombosis, without organisms in the blood.

CASE.—J. F., aged sixteen, cigar maker, was admitted to Gouverneur Hospital, November 14, 1923. The diagnosis was acute mastoiditis. Previous history was negative except that there had been some ear condition five years previously, when the right ear drum was incised. The present history dated back to a few days prior to admission, when he commenced to have pain in the right ear. This was followed by a discharge of pus. The pain in this ear increased, the discharge lessened, and he then commenced to have severe pain from behind the ear to the top of the head. He was seen at the clinic and immediately referred to the hospital for a mastoid operation.

Physical examination upon admittance showed a boy apparently acutely ill. His face was flushed, the temperature was 104°, pulse 130, respiration 26. Examination of the right ear showed a marked bulging drum with a small anterior perforation present. There was a scant purulent discharge and a marked sagging of the canal roof. The mastoid process was swollen and slightly edematous, with the ear lobe pushed somewhat forward. Pressure on the mastoid elicited pain over the cortex, but not at the mastoid tip. Eyes, nose and throat were negative. The neck showed palpable submaxillary nodes. The chest was negative. The spleen was enlarged and palpable about two fingers below the rib margin.

A blood count taken November 15th showed leu-

cocytes 23,000, polynuclears ninety-one per cent. and lymphocytes nine per cent. The urine was negative. A bacteriological examination of the pus from the right ear showed the presence of the pneumococcus and staphylococcus albus.

On November 15th, a simple mastoidectomy was performed in the usual way, and revealed the cortex perforated in two places. The mastoid cells were found broken down to the tip. Considerable foul smelling, cheesy, necrotic material was removed. All diseased bone was excavated. The antrum was located and the lateral sinus exposed down to the bulb, which was found to be of a normal color and pulsating. The mastoid cavity was packed in the usual way, and the patient returned to the ward. The temperature dropped to 100.5°, but the following day the patient had a chill, followed by profuse sweating. The pulse was 120, and the temperature was 103°. He complained of severe headache and felt cold. A blood culture was negative. Urine examination was negative. The temperature remained high for the next two days, averaging 103°. On November 17th, the patient had another chill, and complained of severe headache and restlessness.

In view of the symptoms resembling that of sinus thrombosis, without positive blood culture, the patient was returned to the operating table. On November 20th the mastoid cavity was reopened, and the sinus inspected. The sinus was opened, and profuse bleeding resulted. The jugular vein was dissected out, the incision extending about an inch from the tip of the mastoid to the insertion of the sternocleidomastoid muscle. The vein was not resected, but was tied at both ends. The temperature commenced to fluctuate from normal to 105°, with a correspondingly increased pulse rate. Chills occurred at two or three day intervals. Repeated blood cultures taken on November 17th, 19th, 21st and 25th were negative. A lumbar puncture was negative.

The urine was found to be normal, with the exception of traces of albumin when the temperature was high. The blood counts showed a leucocytosis the highest count being 23,000, the differential count showing an average of eighty-two per cent. polymorphonuclears. No malarial organisms were found.

The high temperature and chills continued. On November 25th, the patient commenced to cough, and had some pain in the submaxillary region of the neck as well as in the chest. A sputum examination for tubercle bacilli was negative. X rays of the chest revealed nothing. The mastoid cavity was dressed in the usual way. Another blood culture was negative. The pain on the right side of the neck increased, and an abscess formed below the mastoid process.

On December 7th, the abscess in the neck was incised, and a large quantity of pus was evacuated. Pressure on the abscess cavity revealed the appearance of pus in the mastoid tip, behind the sinus. The entire mastoid tip was removed, and the cells around the sinus curetted away. The sinus was accidentally opened—free bleeding resulting. The sinus bleeding was checked and the abscess cavity packed and drained. No improvement followed. The patient began to expectorate mucopurulent sputum. X rays of the chest on November 30th showed a general peribronchial bronchiectasis, and on December 11th, a beginning consolidation of the right base, with the diaphragm obliterated, and a possible cavity in the left base.

In view of the clinical as well as the x ray findings, a diagnosis of empyaemia of the right side was made, and on December 12th a rib resection was performed under local anesthesia. About two inches of rib were resected and when the pleura was opened, a large quantity of foul smelling pus was evacuated.

The high temperature and chills continued, and on December 15th a swelling appeared on the neck near the thyroid. The following day this was incised and pus evacuated. On December 24th an area of swelling and induration appeared at the centre of the left thigh. This cleared up with wet dressings.

On December 26th, ten c.c. of staphylococcus vaccine were given intravenously, the patient reacting with a rising temperature of almost 105° and a severe chill. Another injection of vaccine was given on December 28th, and on the following day he commenced to feel better. The temperature commenced to subside. On December 30th the patient was feeling more comfortable. Two doses of staphylococcus vaccine were given on January 4th and 8th, 1924. On January 8th a small abscess appeared at the right side of the neck. This was incised and the pus evacuated.

The patient at this time was weak, and complained of pain at the back of the head. He seemed to be losing ground, and a blood transfusion was decided upon. The donor was his brother, from whom 300 c.c. of blood were obtained, and transfused into the median basilic vein. No reaction resulted. Injections of staphylococcus vaccine were continued.

The patient commenced to feel better, was more cheerful, and was taking a turn for the better, when at his parents' request he was removed from Gouverneur Hospital on January 15th and was admitted to the Manhattan Eye and Ear Infirmary the same day. The diagnosis on admittance was abscess at the nape of the neck. The temperature at the time of admittance was 101.5°. The next day, January 16th, the abscess was operated upon, a crucial incision being made over the occiput. Pus was found under the periosteum. The bone was found denuded. The temperature continued to fluctuate from 101° to 105°, but finally reached 99.5° on January 21st. About four hypodermic injections of insulin were administered. A Wassermann was negative. The blood count taken January 19th showed white blood cells 17,000, polymorphonuclears, eighty-two per cent., lymphocytes, twelve per cent. A blood culture taken January 17th showed no growth in twenty-four hours. Urinary examination was negative.

An x ray examination by Dr. Law showed the right mastoid noncellular, with the appearance of having been operated upon, which accounted for the absorption of bone. The thymus was not enlarged.

On January 28th the temperature dropped to normal. The patient gradually improved and was discharged from the hospital February 8, 1924. At this time the mastoid wound was completely healed.

The patient was seen several weeks later and appeared to be in good health.

COMMENT

In this case the occurrence of the embolic metastasis was undoubtedly due to the dissemination of septic emboli, such as occurs in otitic septic involvement of the sinus, yet at the several inspections of the sinus, no thrombosis was found. The blood cultures were always negative. In spite of this it was decided to ligate the jugular vein near the bulb to prevent the dissemination of septic material. The entire clinical picture was that of a sepsis with the characteristic temperature curve, chills, sweating, leucocytosis and high polymorphonuclear count. The metastasis to the various parts of the body was undoubtedly by way of the lymph channels.

It is our opinion that the sepsis was already present prior to the mastoidectomy, as the patient appeared quite sick when first seen at the clinic. The prognosis was very bad, but took a favorable turn after the blood transfusion, finally making a recovery.

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Bone in the Eye

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Scattered within the realm of human disease are problems in pathology of special and speculative interest, and undeniably among these is the formation of bones in an atrophied eyeball.

This change is not a pathological freak, occurring with a rarity suggestive of an exceptional environment, but one which for many years has been known, more or less exclusively, to ophthalmic surgeons as the natural sequence of degenerative processes. The presence of the bone and the source of its development have led many observers to investigate the problem. In regard to the broad outlines of the pathology there is a general agreement, but upon the question of detail much room exists for the expression of divergent views, views which still belong to the sphere of speculation. In this category is included the source of the osteoblasts which remains, among other details, a matter of uncertainty.

ATROPHY OF EYEBALL AND PHTHISIS BULBI

Incidentally an atrophied eyeball may be described as an eye which is soft, shrunken, and commonly flattened, following an attack of iridocystitis, such as may be caused by penetrating wounds or intraocular operations which have proved unsuccessful, by which the nutrition of the eye has been arrested by the inflammatory changes in the ciliary body.

It may be noted here that Fuchs draws a distinction between an atrophied eye, and one the condition of which is known, ophthalmologically, as "phthisis bulbi" (1). In his view phthisis bulbi, so called, implies destruction of the whole of the intraocular tissues, such as occurs after complete suppuration of the eye. In this case the eye contracts to the size of a hazel nut, whereas an atrophied eyeball retains some semblance to its original formation. Except for cosmetic reasons in the former case no interference is necessary; on the other hand, in the latter, in the course of time enucleation is expedient.

THE OSSIFICATION PROCESS

A period of years is required for the development of the ossification process in an atrophied eyeball—twelve years or more. Cases of much earlier dates have been recorded at which ossification has developed. But these are exceptional; nevertheless the possibility of their occurrence has to be borne in mind.

The mode of detecting the presence of the osseous plates is by means of palpation. Firm, backward pressure is needed, and this gives rise to tenderness, which is at once recognized by the patient. At the same time there may or may not be any sense of hard resistance of the surgeon's fingers, indicating the presence of bone. Again a patient may make no complaint of an eye in which bone has developed, until tenderness is revealed by palpation. The tenderness is probably due to the pressure of what remains of the ciliary body upon the hard bony substance. Palpation of slight degree is not to be relied on; it may elicit no sensation of tenderness, especially as the ossification usually begins at the back of the eye, first developing around the optic disc. The bone also is thickest in this situation, and in the bony plate there is commonly to be seen a round hole, masking the entrance of the optic nerve.

Upon reflection it is strange that bone, incidentally of the periosteal type, true bone with definite Haversian systems, should be evolved out of the degenerated inflammatory products of an eye in an atrophied state. This ossification has been defined as "the final stage of degeneration of the organized inflammatory products of plastic choroiditis" (Parsons). Possibly the eye occupying a confined and isolated space provides the conditions necessary for the development of the ossification process. That bone has been found in structures of the eye other than the choroid, such as the lens and retina, would seem to lend support to this possibility.

Whether the inflammatory changes in an eye, which are ultimately followed by the formation of bone, can give rise to an infective plastic nevitis in the other eye has not been established. No case of the kind has been proved. Modern observation must concede that socalled sympathetic ophthalmitis is not a "sympathetic" but an infective disease, and Hill Griffith has recorded that he has never met with bone in eyes removed for "sympathetic ophthalmitis." Furthermore, this disease is not known to follow

pus infections of an eyeball. Its infective origin must, therefore, depend upon some organism, still to be discovered, in common with other infective diseases, the microorganic source of which has so far defied the efforts of the bacteriologist to determine.

CASE REPORT

Appended are the notes of a case of bone in the eye which recently came under my observation.

CASE.—Mr. X, aged sixty-two, came on October 8, 1924. His previous history was one of many years of articular rheumatism, for which at intervals he had received treatment at Harrogate, Bath, Buxton, and other centres of hydrotherapeutics. Gradually he made a good recovery, and has now for some years been free from his former symptoms. Suddenly, about fifteen years ago, the vision in the right eye failed and blindness ensued. I was unable to gather from him the cause of this beyond the fact that he sought advice and followed the treatment recommended. Since then, at various intervals, his left eye has suffered from severe attacks of iritis. In the course of one of these the right eye became inflamed, and the symptoms suggested glaucoma. An iridectomy was performed by an ophthalmic surgeon. Subsequently the eye gradually became atrophic, and at the time of his visit to me it was shrunken, soft, and flattened. Such, I was told, had been its condition for approximately twelve years. No complaint was made of the shrunken globe; palpation at first revealed no response to tenderness, but when firm backward pressure was made a slight sensation of tenderness was admitted.

Examination of the left eye showed atrophic irritation of the lower lid. For some considerable time drops of a one per cent. atropine solution had been instilled daily in an attempt to dilate the pupil. But the iris was contracted and adherent throughout, the condition present being one of complete posterior synechiæ. The anterior capsule of the lens was fairly clear in the central pupillary space. The tension was good; ophthalmoscopic examination was not possible. The vision admitted was 6/nil; improved to 6/10 nearly, with Œ7 sph. Apart from the defective vision, the complaint made of the eye was an inability to face a bright light, occasionally lacrymation, and a sensation of discomfort. The last attack of iritis occurred four years ago; it persisted for six weeks. Since then the eye has been free from any recurrent reaction.

I enucleated the right eye on October 15th, Dr. S. H. C. Air being present and administering the anesthetic. A plate of bone was found in the eyeball. One or the other of the openings in the back part of the plate would indicate its position around the entrance of the optic nerve.

That these cases are of clinical importance will be inferred from the above, but added to this is their general pathological interest. Having regard thereto, the fact is somewhat strange that it should have escaped the notice of examiners in pathology. The subject suggests a question in an examination paper. For example: "Under what pathological conditions does bone develop in the eye? Describe the pathology of the process. Of what type is the bone? Discuss the views of the origin of the osteoblasts."

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A Case of Obstetrical Paralysis

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The belief which is inherent and widespread among physicians as well as the laity, that practically nothing can be done for the chronic obstetrical paralytic, is the reason for reporting this case. This belief has become ingrown throughout the ages from the fact that those who have sustained this form of chronic birth injury have always remained permanently crippled. This empirical fact has, in recent years, been given a scientific background by the numerous and fine dissections which have been performed to ascertain the pathology of this condition by a host of observers, such as Duchenne, Stransky, Taylor, Lange, Thomas, Fairbank, Sharp, Sever, and others. These dissections have strengthened the belief in the incurability of this disease, for they showed that the ends of the torn nerves were usually found separated and were inherent and embedded in a cicatrix. Since regeneration of nerve is impossible through the medium of cicatrization, especially as it is known that a cicatrix grows more organized and more firm with time, the conclusion is therefore drawn that such a paralysis must remain permanent.

Any hope for the amelioration of this condition was destroyed when attempts to free the ends of the nerves from the adherent cicatrix and reunite them, as was done many times lately, failed to bring the much looked for results (1 and 2). However, since Dr. Sever, of Boston, has modified the Fairbank operation by myotomizing the contracted muscles and removing bony obstructions, his results in a large number of cases have been so encouraging that his procedure can be called the first of any vital importance that was ever done for this disease. The statistics of the Sever operation are found in orthopedic literature, but the report of a single case in a less specialized medium may bring it deservedly to the attention of a wider scope of readers.

CASE.—M. G., aged ten, had a typical obstetrical paralysis of the right arm. The conspicuous deformity in her case was a marked limitation of abduction of the arm. With the affected hand she was never able to touch the back of her head or to arrange her own hair. From birth she was conscientiously treated by many methods. The para-

lyzed muscles, the deltoid coracobrachialis and others, did not respond at all to the faradic current, and responded only sluggishly to the direct current, and gave a positive R. D.

OPERATION

Incision was made from the tip of the acromion down to the insertion of the pectoralis major. The latter muscle was cut across at its insertion. With the arm fully abducted and rotated outward, the subscapularis tendon was located and divided. Another incision was then made at the lower axilla, where many fibres of the serratus magnus were divided. The arm was put in a plaster of Paris cast in a position of extreme abduction for ten days. It was held in that position for three months by a brace, and passive and active motion of the arm was done daily.

FIG. 1.—Extreme height to which the patient was able to raise the right arm, before the operation.

RESULTS

She can now, without any effort, abduct the arm practically as high as the normal arm, though the scapula somewhat compensates for the movement. She can touch the back of her head, and do her own hair, and even throw the arm over her head and reach to the lower lobe of her left ear with her fingers.

It may be argued that the good results of the Sever operation in this case, prove only that the patient had a good deltoid, and that the only pathology was more of the nature of a disturbed muscle balance, probably a stretched paretic deltoid, overbalanced by stronger contracted antagonists, and that the Sever operation, by lengthening these contracted antagonists, removed the only obstacle which prevented abduction of the arm. For how, it will be asked, can the mere lengthening of mucles, which act physiologically as the depressors of the arm, also endow the arm with abduction power, when the main lifting power of the arm, the deltoid, is completely paralyzed?

The Sever operation does not pretend to add power, but only overcomes obstructions. I wish to emphasize this point especially, because it bears directly on the problem as to which case of obstetrical paralysis is suited for a Sever operation. In many cases, the antagonists of the deltoid may be contracted, but the deltoid itself is paralyzed. In such cases some surgeons may rule against the Sever operation, for the reason that it would be useless to lengthen the muscles which put the arm down, when the muscle which raises the arm is totally paralyzed. In practice, however, the Sever operation is indicated as long as the antagonists of the deltoid remain contracted, even if there is complete paralysis of the deltoid muscle.

The reason for this is twofold. First, in spite of all the tests we have at present to determine complete paralysis, such as extreme atrophy, positive R. D., absolute loss of voluntary power, etc., one cannot tell positively whether the nerves and cells supplying the muscle are completely degenerated, or whether there are some fibres or some live cells left somewhere, direct or compensatory, in the spinal cord, that innervate that muscle to some extent. The same is true as far as the muscle itself is concerned. It takes a section of the mucle in question to be viewed under the microscope to tell whether the muscle cells have all changed into connective tissue or fat. Also, we must not forget that all tests for complete muscle paralysis are made on a muscle which has been in a state of permanent hyperstretching during the entire life of the patient. The Sever operation, by freeing the muscle from the grip of permanent tension, augments the residual power, which is always present in paretic muscles. This, of course, may explain the improvement in the abduction power of the arm, which generally follows a Sever operation, where the deltoid is gone, or almost gone.

However, a more practical explanation for such an occurrence is found in a scholarly article by Dr. L. J. Pollack. He reports four cases of permanent paralysis of the circumflex nerve, which have learned in time to raise the arm. He quotes Bunts, who reported nineteen cases of circumflex paralysis, seven of which have recovered function, and of the seven, four recovered function in the absence of the deltoid muscle. He reviews also the literature of the subject, quoting innumerable writers who have reported similar cases. He experimented on the cadaver to learn the mechanism of such an occurrence (cutting away the bellies of the muscles around the shoulder, and attaching strings to the origin and insertion of the muscles, the ends of the strings operated by pullies), and he found that all muscles besides the deltoid, that are attached to the shoulder, and even those muscles that are the antagonists of the deltoid, have power to abduct the arm.

FIG. 2.—After the operation. Patient can raise the arm as high as the normal arm though the scapula compensates.

He says, in part, that the supplementary mobility in deltoid paralysis is produced probably by the subscapularis, the infraspinatus, the pectoralis major, and the supraspinatus, firmly fixing the head in the glenoid cavity. During this phase, external rotation of the humerus occurs. The serratus magnus, trapezius with the rhomboidei and elevator anguli scapulæ then produce a rotation of the scapula elevating the humerus. The abduction of the shoulder is then completed by the supraspinatus, coracobrachialis, long head of the biceps, serratus magnus, trapezius, rhomboidei, elevator anguli scapula, pectoralis major, and supraspinatus. The combined action of these muscles elevates the arm to an angle of about 65°. The movement of abduction of the arm backwards seems to be uncompensated, so that the movement necessary for

putting the arm in the hip pocket, in permanent paralysis of the deltoid, is impossible.

The muscles, therefore, which act primarily as the depressors of the arm, when their action is from their insertion, also possess the reverse power of elevating the arm. In obstetrical paralysis, these muscles are hypercontracted. They prevent abduction of the shoulder. The Sever operation, which cuts these muscles, and the extreme abduction of the arm, aided by a brace for about three months in order to prevent recontraction, make these muscles longer, and not only removes the barrier to direct abduction of the arm, but the power which they possess to raise the arms comes back. Though this form of abduction of the arm, which is executed by the depressors of the arm, is but a compensatory movement, and unnecessary to the normal individual, it is of utmost importance to the paralytic, because it is the only power left to him for raising the arm.

The operation should be done on much younger children than it is generally done at present, for the obvious reason that the obstruction to movement is only muscular at the beginning, while later, however, there occurs contraction of the capsule and the bones deform. It would obviate the necessity of having to chisel away the acromion process, which, in older children, is often found hooked down over the humerus, and which interferes with the raising of the arm. Or, as in the above case, for instance, the capsular ligament was already so contracted that when the arm was forced in abduction, it prevented that movement to the full. Since in this country we are going away from the Fairbank operation (opening the capsule) nothing could be done to overcome that part of the obstruction, except a thorough stretching. The result is that though the patient can abduct the arm as high with the affected side as with the normal, the movement on the affected side is compensated by the scapula.

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Report of a Case of Spontaneous Pneumothorax in a Young Boy

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Case.—Male, aged sixteen. His mother was living and well. Father had had leg amputated for gangrene of the foot. Two brothers and three sisters were living and well.

The patient had had measles at the age of three. No other illness could be remembered either by the patient or by the family, but on close questioning it developed that the patient had suffered from a cough, which would come on occasionally, but no history of loss of weight, night sweats, or any expectoration, at any time, nor did the patient ever consult a physician for his cough.

The present illness commenced November 15, 1922. The boy, while busy with his routine work in the hardware store of his father, was seized with a rather sharp pain in his right chest. He walked upstairs to his room unassisted.

Four hours later I found him sitting on the edge of the bed, holding his hand to his right chest, his face bearing the expression of pain. He seemed to be a boy somewhat overgrown for his age. The head, eyes, ears, nose and throat were negative. There was a tendency to drooping shoulders and the chest was barrel shaped. The apex beat was visible and palpable in the fifth interspace and axillary line on the left side, and the right border under the sternum. This was verified by percussion and auscultation. No murmurs could be made out.

The right chest, on percussion, gave a tympanitic note throughout, both anteriorly and posteriorly. No breath sounds of any kind could be detected.

The left side gave normal percussion and auscultation, with normal respiratory murmur throughout (perhaps a trifle exaggerated.) The abdomen, genitals and extremities were negative. The respirations were short and catchy about 30 a minute. Pulse about 120 a minute, and temperature 100°. Systolic blood pressure 130, diastolic 80. Urine and blood were negative. The diagnosis was a right sided spontaneous pneumothorax.

The x ray examination of the patient's chest, taken a week after the onset of the illness, showed the following:

The intercostal spaces were much wider on the right side than on the left. There was marked illumination on the right side, indicating there was no lung tissue present in this area. In the hilum region (right) was a dense shadow, longitudinal, which was free from above and below. This was the former lung tissue which had collapsed. The left side showed the heart displaced to the extreme left and the trachea and pulmonary vessels also drawn over to the left side. The linear markings were greatly increased. This was due to the left lung functioning alone and increased pressure from the collapsing of the opposite lung. The costodiaphragmatic angle was free and clear. The left apex was also clear.

The patient was kept in bed against his wish. He was entirely free from any cough and discomfort. The pain had subsided after a single dose of morphine at the onset of the illness. There was no cough or dyspnea.

A second radiographic examination of the patient's chest on December 26th (about six weeks after the onset of illness) showed that the right lung had expanded again with the exception of the right extreme base and somewhat along the lower half of the axillary line. There was also a slight amount

of fluid at the right costodiaphragmatic angle. The extreme apex had not yet expanded. The heart had returned to its normal position.

REMARKS

Spontaneous pneumothorax is not as rare, nor does its occurrence always cause grave disturbance to the patient, as one would commonly believe. In fact, I recall a case (in the clinic of Professor Sargo, in the Wilhelmina Kranken Spital, Vienna, June, 1921) where the examination (including an x ray examination) of the chest disclosed a tuberculous cavity in the patient's left lung, the heart in its proper location. A therapeutic pneumothorax was recommended. Two days later, when the patient reported at the clinic, upon examination of the chest a spontaneous pneumothorax was discovered and although the patient's heart was found to be completely displaced into the right chest, there was no recollection on the part of the patient of having experienced any pain or discomfort at any time previous to, or since the last x ray examination of his chest.

Usually, however, spontaneous pneumothorax is ushered in by excruciating pain and a feeling of faintness and dyspnea, and not infrequently it is accompanied by shock, from which, however, the patient soon rallies.

This condition is rare in children and even among adolescents. It is more common in adults between twenty-five and thirty-five, and is likely to occur to people engaged in heavy occupations, where severe and sudden strain calling for extra severe exertion brings about a rupture of a long standing pulmonary and pleural lesion, usually of a tuberculous nature.

NOTES

S. West (1) has made experiments on lungs, postmortem, which have shown that unless the lung tissue has been previously diseased the alveola will stand a great deal of pressure, and will not rupture, and when the lung does rupture the result is usually an emphysema of the subpleural or mediastinal type and rarely intrapleural.

Ness and Allen (1) report a case in a healthy boy twenty-two years old who recovered within seven weeks, in whom no tuberculous symptoms could be found.

Hamman (2) cites a case where the patient suffered four attacks in the course of four years, and only after the last attack were tubercle bacilli found in the sputum.

Jachman (3) reports a case referred to his clinic for frequent pollutions and incidently only did the patient mention that he was experiencing slight pain in his chest for the past few days. On examination a complete right pneumothorax was found.

Morrison (4) reported a case in a boy of nineteen years with a recurrent attack in the left chest, five weeks after the first attack in the right chest, with ultimate recovery. Schoenstein (5) reported a case in a child eight months old.

Bourne (6) reported a case in an infant eighteen months old. On autopsy he found a left sided pneumothorax and left pleura studded with miliary tubercles. The lung on the same side showed a cavity at its apex and adherent to the pleura, and a right sided bronchopneumonia. Martin and Knox (7) reported a case in a boy of seven years following an outburst of crying, accompanied by vomiting, dyspnea, pain in the chest and abdomen; this was mistaken for acute appendicitis, but subsequently was diagnosed as pneumothorax.

Zuppinger (8) reported a case in a child two and a half years old; the pneumothorax came on while the child was asleep at night and proved fatal in thirty-six hours. The symptoms were severe abdominal pain, dyspnea, cyanosis of lips, cold perspiration of forehead, all of which came on suddenly in a child that was perfectly well, on retiring, in the evening. The autopsy showed a perforated lung due to a corn kernel which the child must have aspirated during its sleep (the mattress was full of these kernels).

Ash (9) reported a case of a four year old girl on the eleventh day following the aspiration of a little sharp stone. Rosenthal (10) reported the case of a sixteen year old boy following the ingestion of a sharp bone, which perforated the pleura through the wall of the esophagus.

Müller (11) reported a case in a sixteen year old girl where three round worms were found to have perforated the diaphragmatic pleura on the left side, and so caused a pneumothorax, which proved fatal.

Pitt and also Rolleston (12) each reported a case, both of which proved fatal within thirty-six hours. In both cases severe hemorrhages into the pleural cavity were found. Osler (13) quotes West to the fact that ninety per cent. are due to phthisis.

Pfoundler and Schlossman (14) give as the causes of pneumothorax the following: Phthisis, whooping cough, measles, bronchopneumonia, gangrene of the lung, softened bronchial glands and trauma, either from foreign body or of external injury.

One author, Goodhart (15), believes a rupture of an emphysematous bleb is the cause in many cases, which probably was the case with our patient, as far as one could judge from the existing evidence.

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Latent Chronic Empyema*

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Chronic empyema running a latent course without the history of an acute onset or a period of respiratory symptoms is an unusual occurrence. The following is a report of just such a case.

CASE.—J. J., female, single, fifty-three years old, was admitted to my service, May 9, 1921, at 5 p. m. This history as given by the patient and her friends was that she had been perfectly well and working until an hour before admission.

She was ashen gray, very dyspneic, pupils widely dilated, conjunctiva pale and without petechiæ. The veins of the neck were markedly engorged, the submaxillary glands were palpable. The tongue showed an angiomatous conditions of the veins at the base. The body was covered by a profuse clammy sweat. The aorta was not felt in the jugular notch. The lungs showed fine crepitant râles through the entire chest. Anteriorly over the right side, percussion revealed dullness from the third space merging into liver dullness and extending eight centimetres below the free border of the ribs. Posteriorly there was dullness merging into flatness as high as the fourth rib. No area of dullness could be made out near lower left dorsal spine.

The heart revealed a rough systolic murmur best heard at the apex, and transmitted over the whole heart into the left axilla. The right border of the heart could not be definitely made out by percussion as it merged with the dullness described in the right lower chest. The left border was made out fifteen cm. from the midsternal line in the fifth intercostal space. The pulse was regular, thin, and eighty to the minute. The blood pressure was 118 systolic, 60 diastolic. The liver was very tender, and felt eight cm. below the right lower ribs. There was no ascites. The spleen could not be felt. A slight edema was present. The patient showed no improvement and died forty hours after admission.

A diagnosis was made during life of an underlying arteriosclerosis involving the coronaries with secondary myocardial fibrosis. The immediate cause of death was thought to be an acute cardiac insufficiency, probably as a result of recent thrombosis of the coronary artery. However, just before the postmortem examination it was thought that the dullness of the liver upwards and downwards was entirely too great to be accounted for by an acute venous stasis, and that a massive effusion in the right lower chest was the more likely. On account of the absence of a Grocco triangle of dullness in the left posterior chest, it was suggested that a latent thickly encapsulated empyema could account for all the physical signs, that the heart sounds were too good for a severe myocardial necrosis resulting from coronary thrombosis. The dullness could be more readily explained on the basis of an effusion in the right lower chest pushing down the liver and forcing the heart over to the left.

The postmortem examination revealed the following: An encapsulated empyema on the right side. The pyogenic membrane above was at the level of the third intercostal space, below it extended down to the diaphragm, and was from one eighth to three sixteenths of an inch in thickness. It was dense and shaggy and enclosed a cavity containing about two litres of thick creamy pus having many fibrinous flakes. The right upper lobe of the lung was markedly congested, the right lower lobe completely collapsed, airless, tough and indurated, and densely adherent to the pyogenic membrane. The left upper lobe showed marked emphysema, the lower lobe was congested.

The heart was not displaced. The pericardium was normal. The right auricle and ventricle showed slight dilatation, the left auricle normal, the left ventricle not hypertrophied or dilated. The musculature of the heart throughout showed brown atrophy. The mitral valve was markedly sclerotic at the base of the posterior cusp. The other valves and coronaries were normal. The aorta was very elastic and showed a slight amount of sclerosis near the coronary orifices.

The liver was not enlarged, but pushed down. Its surface was smooth and pale. A pale dense hard area measuring one and one half by two and one half by one cm. was noted on the upper left lobe, which was probably an old cicatrized infarct. The liver was resistant to the knife, and on section showed a nutmeg appearance with fatty degeneration. The gallbladder and bile ducts were normal.

The stomach mucous membrane was pale. Multiple diverticula of the colon were present, none being very large or infected. The appendix was normal. The right kidney was enlarged and congested. The left kidney showed congestion and prominent renal arterioles. The spleen was slightly enlarged, firm and showed prominent Malpighian bodies.

The anatomical diagnosis was encapsulated empyema of right chest, fibroid pneumonitis of right lower lobe, brown atrophy of heart, slight aortic sclerosis, chronic passive congestion of the liver, spleen and kidneys.

A positive diagnosis could have been made during life either by the use of exploratory paracentesis or the use of the x ray. Either method was out of the question, because of the desperate condition of the patient, on account of the necessary exertion and added strain to the heart. Had a positive diagnosis been made, it would absolutely have come too late for surgical intervention. A mere thoracotomy and drainage would not have resulted in the obliteration of the tremendous cavity on account of its rigid walls and indurative fibrosis of the right lung. It is open to question whether the patient could have survived such a procedure at the time, or having survived the ordeal, been able to undergo an extensive thoracoplasty.

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Practical Therapeutics

THE TREATMENT OF MALTA FEVER

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Although essentially an exotic disease, Malta fever is occasionally met with in temperate countries. Cases have even been reported in Switzerland. Therefore it is well to insist upon the tact that it *can* be met with anywhere.

Malta fever is an essentially proteiform infection, due to Micrococcus melitensis, discovered by Bruce. Its duration is long, the temperature chart usually showing a characteristic thermic curve composed of successive rises, often irregular and separated by periods of apyrexia. The undulatory type of fever is most common. Besides there are profuse sweating, constipation, neuralgia, rheumatoid pain, as well as many complications respecting no organ of the body. Emaciation is always prominent, the loss of weight amounting to from thirty to sixty pounds.

There are two other forms of the disease, although less commonly encountered, namely, the malignant type, characterized by an early typhoid state resulting in death in two or three weeks, and the intermittent type lasting for months and offering less severe complications than the other two varieties. Convalescence is invariably long.

Pathologically, there is no characteristic lesion. Those met with are the ordinary ones of septicemic processes, viz., localized areas of congestion in the gastrointestinal tract, sometimes hypertrophy of Peyer's patches and follicles, small ulcers exceptionally, moderate mesenteric adenitis, hepatic hypertrophy and congestion, spleen very large, hyperemia of kidneys, heart more or less flabby, foci of pulmonary congestion, etc. There is a mononucleosis and the specific bacterium can be isolated from the blood and viscera.

Propagation of the disease appears to be due to animals, especially goats. Transmission of the disease is due to inhaling microbiferous dust, or, more frequently, from ingestion of food carrying the specific organism—goat's milk or cheese and food soiled by the urine or feces of diseased animals or man.

In practice, one should invariably think of Malta fever when a patient presents an abnormal type of pyrexia; the differential diagnosis will be between typhoid fever, influenza, paludism, and pulmonary tuberculosis. The clinical signs are generally insufficient for making a sure diagnosis, hence blood examination is of the first necessity. Hemoculture and serodiagnosis will make the diagnosis a certainty.

The prognosis of Malta fever is relatively good *quoad vitam,* the mortality averaging about two per cent., but the duration of the disease—six weeks to one or two years—is the dark spot in the prognosis.

Prophylaxis consist of sterilizing goat's milk, but it must be remembered that there are other animals such as sheep, asses, mules, cats, and rats, that may be infected and infecting, thus contributing to the spread of the disease by soiling the various places where they live with their germ bearing urine. Hence the ways of contagion are multiple and therefore it happens that the etiological notion is rarely evident and in the majority of cases nothing can be found to explain the development of the disease.

As there is no really specific medication, the treatment of Malta fever is purely symptomatic, being directed to the fever and pain. Medium doses of quinine, pyramidon salicylate, aspirin or phenacetin, singly or in combination, may be essayed, always remembering that none of them affect the temperature and that if the fever is not high, as is usually the case, it is preferable to abstain from the exhibition of an antithermic medication which increases the already profuse sweating and has an unfortunate action on the digestic tract.

Should the thermic reaction be excessive, it is best dealt with by the exhibition of quinine in large doses *per os* or subcutaneously, but it must not be continued for too long a time. The neutral hydrochlorate of quinine, injected into the muscle in doses of two grams fifty centigrams at a single injection in the morning, and repeated again in the evening if necessary, is an excellent means for controlling the temperature. But above all, tepid baths, cold packs, and vinegar lotions, repeated as required, should always be resorted to.

Constipation should be relieved and the penetration of the bacteria into the intestinal mucosa will be prevented by repeated doses—thirty to forty grams—of castor oil and large irrigations of the bowel.

Analgesics for the relief of the painful phenomena are to be used with caution, and although not always successful, topical applications, *loco dolenti,* with suitable liniments should be tried.

For excessive sweating there is nothing better than atropine sulphate, in doses of one quarter of a milligram three times in twenty-four hours.

In the serious forms of the disease intravenous injections of electrargol should be given in order to activate the phenomena of organic defense, likewise physiological serum to sustain the organism and to facilitate the elimination of the bacteria and toxins by the urine.

Herzen and others are opposed to the use of Wright's serotherapy with the serum of immunized goats, as no positive results have so far been obtained, but they do advocate vaccinotherapy with injections of dead cultures of the Micrococcus melitensis, in doses of one quarter of a cubic centigram every ten days, but only in chronic cases with a low temperature.

The patient should invariably be kept in bed, and an absolute milk diet should be ordered at the onset of the disease, and this should be continued if the process assumes the more serious types. In the undulating type of temperature, broth, meat juice, and the yolk of eggs beaten up in broth or in milk, macaroni, etc., should be given. During apyretic periods a more substantial diet of eggs, jellies, light meats, creams, and jams is proper, and tonics con-

taining quinine, kola, and the phosphoglycerates are to be exhibited. The patient should wear flannel undergarments and avoid all chilling of the body.

When convalescence has begun a change of climate is essential, a high altitude being preferable, combined with ordinary medicinal treatment employed in any case of recovery from an infectious process.

Radium in Medicine.—C. J. Broeman (*Ohio State Medical Journal,* April 1, 1924) says that in all probability the most valuable influence of radium at present is to be noted in the amelioration or cure of conditions generally termed inoperable and incurable. One of the strongest arguments in favor of radium therapy is the fact that its rays show a selective action on different types of cells, and while all tissue cells are susceptible to its influence, the neoplastic, abnormal, or pathological cells are noticeably altered or destroyed, while the surrounding healthy cells resist the influence of these rays.

This selective action of radium is often lost sight of by the physician. Some are not willing even to admit this fact, but what better example can be given to illustrate this fact than the remarkable way a large cavernous nevus will disappear when radium is properly applied. In some cases not even a scar remains to show where the original abnormality was located. This result is not attained by any other form of radiation including the x ray, which to my mind proves that the rays given off by radium are, in some respects at least, entirely different in action from the x ray, which for instance does not materially influence nevi.

The author mentioned cases of splenomedullary leucemia in which he treated the patients with radium and they are living today, although not cured, and are well enough to continue their regular occupation. In these cases a large quantity of radium was applied directly over the spleen for from fifteen to twenty hours. One such application with 350 milligrams of radium an inch and a quarter distance, usually reduces the white cell count from 90,000 to 30,000. The spleen also becomes smaller with such an application. The following case which is given in detail is a typical illustration.

The author quotes the case of a man, aged twenty, who first consulted him on September 29, 1922. His chief complaint was inability to see well and do work as a clerk. He had previously consulted three physicians in as many states, without a definite diagnosis having been made. Examination showed a poorly developed boy, very pale. He talked rather foolishly, a condition which careful examination proved to be due to anemia of the brain. General physical examination, including the heart and lungs, was negative. Urine contained trace of albumin. Examination of the abdomen showed it to be greatly enlarged, resembling the potbelly of a child. The spleen practically filled the abdominal cavity, extending over on right side of lower border of the liver. Serological examination confirmed at three different laboratories, was negative. A diagnosis of splenomedullary leucemia was made. The patient was given two radium treatments with good results.

The author also calls attention to the fact that in generalized lymphosarcoma radium causes the individual nodules to disappear as well as the pain that is often associated with their presence. It is reasonable to assume that if the primary lesion in this disease can be treated thoroughly with radium in its beginning, this incurable disease may be prevented from its usual fatal ending. He also reports six cases of Hodgkin's disease in which five cases resulted favorably from treatment with radium, the outcome of the one case being unknown as the patient was lost sight of. The results obtained in Hodgkin's disease were all the more remarkable as a number of the patients were of advanced years. The author is of the opinion that no patient need die of Hodgkin's disease if the diagnosis is made before the entire glandular system has become involved, and radium properly applied in large enough quantities. He concludes as follows: It is urged that the value of radium be recognized as a powerful means of therapy, and its tremendous possibilities be given the attention it merits. The limits of its application are unbounded and it becomes our duty to further the practice of medicine with this splendid means in our possession, by exerting every effort toward the improvement of technic, applying our best powers of discrimination as to its application, and devoting the same diligent perseverance throughout, that has in the past been given to surgery and other forms of therapy.

The Use of Tryparsamide in Neurosyphilis.—W. F. Lorenz, A. S. Loevenhart, Thomas F. Reitz, and C. P. Eck (*American Journal of the Medical Sciences,* August, 1924) conclude as a result of their experience in the treatment of 185 cases of neurosyphilis over a two year period that tryparsamide and mercury salicylate are therapeutically effective in early paresis, meningovascular syphilis, and, to a lesser extent, in taboparesis, tabes and in advanced paresis. The beneficial clinical results generally precede the improvement in the serology. Definite paretic psychoses disappear as the result of treatment and the mental restoration has persisted over a two year period. Visual disturbances occurred in seven per cent. of the total number treated. In tabes and taboparesis twenty-three per cent. of the cases showed visual disturbance. Of thirteen cases showing amblyopia during tryparsamide therapy all but one cleared up after the withdrawal of the drug. Twelve of these cases were subsequently treated with tryparsamide without further eye disturbance.

Treatment of Tuberculosis with Sodium Morrhuate.—John Hume (*Lancet,* July 26, 1924) found sodium morrhuate of great help in advanced cases, but not so sucecssful in the early ones, in whom it appears to lead to a complete arrest of the disease. It is easily administered by subcutaneous injection. The author usually begins with 0.5 c.c., and if the reaction is only very slight, he proceeds to a dose of 1.0 c.c., administered twice weekly. There does not appear to be any advantage in using a larger dose. Sometimes a slight local reaction around the needle puncture is observed which is apt to occur if a month or so had elapsed since the last injection. It is used in a 3 per cent. solution. The bottle should be allowed to stand in warm water for a few minutes before use, when it should be quite clear.

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The Treatment of Socalled Essential Arterial Hypertension*

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Slowly but surely our knowledge of the states in which chronic arterial hypertension is encountered is becoming more extensive, more precise, and better coordinated. Clinical workers and laboratory investigators are vying with one another in observation and experiment directed toward the unravelling of the very complex problems of vasomotor regulation in health and in disease. The number of publications that have appeared in recent years upon the subject of blood pressure is appalling, though an occasional collective review like that of H. Kahler (1) goes far toward lightening the burden of those who desire to keep pace with the progress of knowledge in this extraordinarily interesting and diligently tilled field. Thanks to studies at the bedside, we can now recognize a whole series of symptomatic hypertensions, for example, those associated with renal diseases, with arteriosclerosis, with cerebral lesions, and with plethora, and we distinguish also a group of hypertensions that, for the present, we speak of as primary or essential hypertensions (hyperpiesis) because of their occurrence in the absence of the conditions believed to be associated with the symptomatic forms. Physiologists, pathologists, pharmacologists and biochemists have, through animal experiment, provided us with a mass of information regarding possible modes of origin and the mechanisms of heightened blood pressure. And, recently, clinicians have made laudable attempts to evaluate this experimental work for the better understanding of the pathogenesis and for the more scientific classification of the hypertensions met with in man.

Such attempts at pathogenetic subdivision have been fruitful, not only for the groups of hypertensions of nephropathic and of atherosclerotic association, but also for the functional hypertensions that appear to be independent of organic lesions in the kidneys or in the heart and bloodvessels. Particularly noticeable of late have been the efforts made to distinguish hypertensions according to the part of the vasomotor regulatory apparatus upon which the stimuli that give rise to increased blood pressure impinge. And even though it may seem to some of us that discrimination between centrogenous and peripherogenous hypertensions, on the one hand, and between neurogenic and chemogenic hypertensions, on the other, is less easy (in the concrete cases met with in actual practice) than some nosologists would have us believe, still we should welcome warmly every such serious endeavor and should seek, through carefully controlled clinical experience, to determine the value of each newly proposed grouping.

For if, for the hypertensive states, we are ever to develop a therapy that is something more than mere symptomatic or empirical treatment, it is essential that we acquire exact knowledge, 1, of the internal and external causes that are operative in each form of hypertension; 2, of the effects that follow upon the causative influences, and 3, of the serial order in which those effects make their appearance. Rational therapy can make headway only as our knowledge of etiology and of pathogenesis progresses. In the interest of therapy, therefore, as well as of physiology and pathology, it is highly desirable that investigations of disturbances of the vasomotor regulatory apparatus continue to be prosecuted with unremitting vigor.

In the treatment of socalled essential hypertension we are still greatly handicapped both by our lack of knowledge of its causes and by our defective understanding of the serial sequence of events that constitute the links of its pathogenetic chain. That the causes lie partly in the germ plasm and partly in environmental influences seems certain. The tendency of essential hypertension to occur in families, as well as its incidence among persons of certain types of constitutional makeup (those with certain vasopathic, neuropathic and endocrinopathic inferiorities) point to a *predisposition* that is genotypically determined. Studies in constitution clinics should prove helpful here.

What the environmental factors are that influence persons thus predisposed, by acting on their vasomotor regulatory mechanisms so that disturbances occur that result in the appearance of chronic arterial hypertension, are far from being clear. They may, and probably do, vary in different cases. Among those that, according to our present knowledge, seem to be of greater or of less importance may be mentioned: 1, infectious processes; 2, chronic intoxica-

*Read by invitation before the New York County Medical Society, December 22, 1924.

tions; 3, dietetic errors, and 4, exposure to stresses and strains (mental or physical) that increase the wear and tear of life. Success in prophylaxis will depend upon a more precise formulation of these influences of heredity and of the environment than we as yet possess. But sometime, doubtless, physicians will reach a stage of knowledge upon which eugenic and euthenic programs that will prevent essential hypertension can be definitely and confidently proposed. Even now, the careful supervision of families by general practitioners, the early detection of symptoms that point to the existence of the predisposing constitutional inferiorities (O'Hare and Walker have called attention to some of them that occur as early as the second decade of life), and careful education in physical and mental hygiene, such as sensible diet; regularity of work, exercise, rest, recreation, bathing and sleep; maintenance of the body weight at or a little below the calculated ideal; proper care of the teeth and gums; regular habits promotive of the elimination of waste products from the body; avoidance of every kind of excess; the cultivation of self-control; and arrangements for a well balanced life with normal satisfaction of all the human desires and instincts, will do much to prevent the development of the disturbances of the vasomotor regulatory mechanism under discussion.

The application of causal therapy, once essential hypertension has been discovered to exist, up to now has had to be limited to education in hygienic living, to the reduction of weight in the obese, to the removal of discoverable foci of infection and sources of chronic intoxication, and to psychotherapy in the broader sense, upon which I have always, for the treatment of this disorder, laid considerable stress (2). It is the duty of a physician to allay the fears of the hypertensive patient and to inspire him with confidence and hope. After a thorough diagnostic study, including a careful investigation of physical, mental and social habits, of hours of work and rest, and of exposure to stresses and strains, the patient's exact situation should be explained to him, and definite assurance given that he will be instructed in the best way to live and to enjoy life despite his hypertension. A regimen, corresponding to the stage of the hypertensive process in which the physician finds him to be, should then be initiated, one that is calculated (according to the circumstances) to cure, to arrest, to delay, or to mitigate the disturbance of the blood pressure regulating mechanism. And this regimen should be closely supervised, at least until the patient has been taught how best to conduct his life in the interests of his health and of the continuance of his working capacity. A conscientious physician and a cooperative patient will not go unrecompensed for their trouble if they will pay careful attention to the details of treatment, especially in the early stages of essential hypertension. Occasionally the blood pressure will thus become normal and stay so. More often, the pressure can be markedly reduced and kept at a relatively low level over long periods.

In addition to the measures just discussed, patients not infrequently urge their physicians to make use of remedies intended to lower the blood pressure directly rather than to remove the influences believed to be causative. And many physicians yield to this desire for a socalled functional therapy. Some measures of this sort there are that can be applied probably without harm. Temporary rest in bed, a short vacation with injunctions against overexertion or excitement, a course of tepid baths with massage, or exposures to the high frequency current, or to radium emanation, may be followed by some temporary reduction of the pressure and will probably do no harm, except perhaps that such measures may sometimes mislead the patient a little as to the principal aims of therapy. As a rule it is best when the pressure is markedly elevated to discourage the idea of resorting to forms of therapy that are intended directly to reduce the blood pressure to the normal level or near it. The use of nitrites, particularly should be avoided (except in complicating angina pectoris or in hypertensive crises) since patients usually feel worse after their administration, even though the pressure is reduced by them. In emergencies, venesection or lumbar puncture may be used with advantage to bring about a pressure reduction. By restriction of the intake of sodium chloride to 0.5 gram a day Allen states that he has been able in many instances to reduce the blood pressure markedly and to hold it at a much lower level than is possible without salt restriction. Such a regimen is not without its hardships, however, and in some instances salt deprivation symptoms (asthenia, anorexia) add to these hardships. I have usually been content with a more moderate restriction of the salt intake. The possibility that some increase in the pressure is needed by the patient should not be lost sight of, though I hesitate to lay stress on an assumed compensatory nature of arterial hypertension because of my prejudice in general against the entertainment of teleological hypotheses.

Recently, a number of other methods have been vaunted for pressure reduction, among them intramuscular sulphur injections by Rusznyák (3), the intravenous injection of hypertonic glucose solution by E. Meyer (4), and systematic bromide therapy by Henius (5).

Thus in the medical clinic of v. Korányi at Budapest, Rusznyák injects one centigram of a one per cent. suspension of sulphur in olive oil into the gluteal muscles and at intervals of two or three days gives successive injections, increasing the doses to two, five or even ten centigrams, "until the spasm in the peripheral vessels is overcome and a marked fall in blood pressure occurs." After four or five days he gives a second course, and a month later more injections. Combined with rest in bed, reduction of the intake of salt and fluids, and veronal at night, he reports marked pressure reduction and improvement of subjective symptoms. He attributes the fall in pressure to the febrile reaction produced by the sulphur. He asserts that the pressure often stays at a lower level for a long time, perhaps because a vicious circle has been broken into. The treatment is admittedly painful.

In Meyer's clinic, in Göttingen, the use of intravenous injections of hypertonic solutions of glucose was begun for the relief of angina pectoris in hypertensive patients (according to the earlier suggestion of Büdinger in 1914). To Meyer's surprise not only was the angina relieved but the blood pressure remained lower, often for some time. He then tried

he same remedy in essential hypertension and secured marked pressure reductions, he believes with benefit to his patients. He injects ten c. c. of a wenty per cent. solution of glucose intravenously. The pressure is said to fall gradually after a time (thirty minutes to two or three hours) and may remain down for several days. Anginal attacks and attacks of intermittent claudication are said to vanish, even if the blood pressure subsequently returns to its former level! Since there is often a hyperglycemia in hypertensive states, Meyer suggests that the glucose injected may act (not because of increased glucose content of the blood) but by bringing about some dislocation of the system of blood colloids.

In Kraus's clinic in Berlin, Henius, because Kylin of Stockholm viewed essential hypertension as a general vasoconstriction of nervous origin, tried systematic bromide therapy (three or four doses a day) for two or three weeks at a time, repeating the course from time to time. Not only did the blood pressure in the patients treated remain at lower levels but certain symptoms (headache, precordial oppression, and fatigability) disappeared. He used the treatment on patients who could not afford to rest and states that they continued at their occupations while undergoing treatment. He believes that besides relieving symptoms a favorable influence is exerted upon the disease process itself.

The three methods of functional therapy mentioned have only recently come to my attention and I have not as yet had any personal experience with them. I merely mention them in order that any one who is interested may give them a trial, if he desires to do so. In connection with the bromide therapy, I may say that as a sedative in neurotic hypertensive patients I have been pleased with the effects of the compound chloral and bromide mixture of the National Formulary. It might, I think, be tried systematically in place of the simple bromide treatment of Henius. Kylin has recently suggested a combined calcium and bromide therapy, not uninteresting in view of Ralph Major's observations upon the prompt reduction of the increased blood pressure in methylguanidin intoxications by the administration of calcium.

One point in connection with the passing of judgment upon the effects of remedial measures in chronic arterial hypertension should, I think, be particularly stressed; I mean the great variations that the pressure may undergo independent of any treatment that we apply. The keeping of blood pressure curves, in essential hypertension especially, will convince any cautious observer of the importance of these socalled spontaneous variations.

In the later stages, and especially in the terminal stages, of essential hypertension, complications (cardiac, renal, cerebral) may become threatening. Here a sensible regulatory therapy, that is to say, a therapy directed toward helping the body to react against the disease process, may become necessary, viz., support of the heart; protection of the kidneys; promotion of elimination through the intestine and the skin. The general principles of such a regulatory therapy are so well understood and so generally applied that I need not stop to describe them. Digitalis should, in my opinion, be used in the failing heart of arterial hypertension just as in any other form of myocardial insufficiency.

It is not necessary for me to discuss the treatment of the single symptoms of which hypertensive patients may at times complain. Not that I consider symptomatic therapy unimportant; on the contrary, it should never be neglected by the physician, for, properly applied, it will add much to the comfort and welfare of the patient. Insomnia, headache, dizziness, apprehensiveness, anginoid pains, dyspnea, have their special significance and demand appropriate treatment for their relief. For insomnia, allonal is helpful; for headache, luminal in small doses; for angina, intravenous hypertonic glucose solution; and for dyspnea, digitalis.

Excellent discussions of the details of certain features of the treatment of essential hypertension will be found in recent articles (6, 7, 8, 9, 10, 11).

But none of us can be satisfied with the methods of treatment that are now available. New and better methods of treatment and especially of prevention must be found. There will be no short cut to these. They can only be elaborated after the confines of knowledge have been further extended in our experimental institutes and in our wards and clinical laboratories. Especially promising would seem to be the studies, 1, of the capillary circulation with its "peripheral heart," and 2, of metabolism, and especially of mineral metabolism, that are now being prosecuted. I have been particularly impressed by the great advances made in our knowledge of chemical influences upon the respiratory regulatory mechanism and especially of the relations of the hydrogen ion concentration of the blood and of the nervous tissues to the activity of the respiratory centre (12).

It has been very clearly shown there that the physiology of respiration falls in large part within the domain of the physiology of mineral metabolism, respiration serving as a most delicate regulator of the acid base equilibrium in the organism upon which the normal functions of the body tissues so largely depend. Now the main vasomotor centre that has to do with the regulation of the vasoconstrictor and vasodilator impulses throughout the body (and, accordingly, with the regulation of blood pressure) lies near the respiratory centre. We are, therefore, confronted by the task of determining for this latter centre the conditions by which it also is influenced. It may be long before we have such precise information regarding this vasomotor regulatory mechanism as we already possess regarding the respiratory regulatory mechanism.

Investigation of the blood serum in certain cases of nephropathic hypertensive states has, however, already shown the existence of marked deviation from the normal in the relative quantities of the several electrolytes and the electrolytes present (*poikilopikrie* of Straub). In such cases the kidneys seem to have lost the power promptly to excrete excesses of acid and basic valences corresponding to varying demands; according to the constancy of content of the serum in individual ions becomes impaired. But studies like those of Henderson, of MacNider, of Van Slyke and Cullen, of Allen and Sherrill, of Denis and Hobson, of Mosenthal and Short, of Wallace and Pellini, of Palmer, Atchley,

Loeb and Benedict in this country, of Marrack in England and of Straub and Meier in Germany are long and tedious. It is no easy matter by physical chemical methods accurately to determine anion and cation balances and dislocations or to make the other elaborate analyses and deductions that work on mineral metabolism and on colloidal chemistry entails. But those who are doing clinical investigation await eagerly the results of such researches and are hopeful that through them before very long more of the mysteries of essential hypertension may be unveiled.

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The Importance of High Blood Pressure

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High blood pressure is a sign of some underlying disorder or autointoxication and is almost certainly a compensatory process. It is wrong to treat it simply by dilating the vessels or by depressing the action of the heart. Nitroglycerin is useful in any crisis that comes to a person with high blood pressure and everyone with high blood pressure should have it on hand to use if anything goes wrong. A temporary or momentary reduction of the pressure to relieve pain or prevent damage has nothing to do with the old fashioned attempt to reduce blood pressure by drugs or electricity. The essential thing to treat is the overeating, worry, and the neglect of exercise that are so often at the bottom of the underlying condition. The object of our treatment is not to reduce blood pressure but to prevent a further rise due to a continuation of the underlying cause. While it is only sensible to give a person coming to one in an excited stage of blood pressure disease a short period of rest in bed, nevertheless, physical immobility is the worst thing that can be inflicted upon a person with high blood pressure. I have witnessed the continuing good condition of some of the most extreme examples of high blood pressure disease that one ever encounters through insisting upon exercise out of doors every day to the point of physical fatigue. These exercises, which become a hobby, may take the form of golf or may be facilitated by visits to cure resorts, have not under my observation resulted in any of the predicted accidents due to ruptured bloodvessels or a dilated heart. Worry, of course, is the great foundation of blood pressure diseases and these persons should come under the moral as well as the physical care of the physician who should endeavor by all means to evolve a proper philosophy of life. This implies the curbing of unreasonable ambitions. As to drugs, a full dose of castor oil at least once a month is a life prolonging procedure.

When people come under my care in the excited stage of blood pressure disease showing every sign of toxemia it is my custom to prescribe castor oil according to the following formula: A full dose the first, third, fifth, twelfth, twenty-sixth, fort seventh and eighty-fifth day of treatment. Aft that it is to be continued every four weeks. Peo under observation for ten or fifteen years for hi blood pressure have spoken with confidence of t benefit they derive from their monthly dose of cast oil. As to nitrites, nitroglycerin seems to fulfill eve need and I seldom use the others.

Nitroglycerin regulation in a high blood press subject, particularly if he has angina, is not an ea matter. He is taught to experiment with a ve small dose of something less than a two hundre of a grain, and he is told to take one on all th occasions where it proves satisfactory. A single d will often break the nervous tension that keeps person awake at night and a single pellet will of relieve cardiac distress and allow the person to ta the exercise he needs.

After twenty-five years' trial electricity has prov to be a failure in producing any lasting benefit a I have seen it do a great deal of harm.

The use of digitalis in high blood pressure su jects is now recognized universally to be benefic Its continuous use is absolutely necessary in peo who show a tendency to recurrent attacks of sui cative edema.

Bromide is among the best systemic remedies high blood pressure. By putting the whole nerv system in flexible splints, by the use of five gra each of sodium potassium and ammonium bromi three times a day, one can often help a good d while the person is gaining his physical equilibri through exercise, diet and castor oil.

With regard to diet, I have been impressed by large number of people seriously ill of high bl pressure disease of the cardiorenal type who h been distinctly benefited by the withdrawal of e from the diet. In some the result has been so strik that I cannot but believe there was an anaphyla reaction from the eggs in the diet. Unfortunat it is not the universal rule. There are those w

very high blood pressure who tolerate eggs very well. When a man has taken eggs out of his diet, including the eggs in madeup dishes, he is exercising a supervision over his food that is quite comprehensive.

I have had my suspicions that the salt free diet often works as a means of reducing food intake on account of the elaborate attention necessary. In the same way an eggless diet reduces the intake of rich dishes and even where there is no specific sensitiveness to eggs, proves useful. I have seen extreme cardiovascular disease where the return to an egg diet had been repeatedly followed by very definite symptoms of general systemic irritation and where I felt morally certain that the eggs were specifically harmful.

No one would be foolish enough to say that high blood pressure is not a dangerous condition, but most of us have reached the conclusion that an unwise reduction of it is even more dangerous. In several instances people with blood pressure as high as 240 systolic and 120 diastolic have been followed for more than ten years while they took care of themselves by a suitable regimen. It is universally recognized now that a high diastolic pressure is more serious than a high systolic pressure. A high diastolic pressure usually indicates a granular kidney which of course is always threatening to result in one of the terminal accidents.

We must refer once more to the question of secondary low blood pressure. I tried to introduce into literature the term "secondary low blood pressure" in my first book on blood pressure but, like many other small enterprises that have been launched in literature, this term has never succeeded, apparently, because I have seldom seen it in use. By secondary low blood pressure I mean low blood pressure following a previously continuing high blood pressure and I pointed out how important it was to distinguish between the systemic low blood pressure that one encounters in so many neurasthenic subjects and the low blood pressure that was found in invalids who had previously had high blood pressure. The recognition of this condition in very sick people has often led to brilliant results. A good rule is to maintain, if possible, the usual pressure in every illness. This leads us to the matter of cerebral hemorrhage.

As a matter of fact a cerebral hemorrhage does not occur with any more frequency in very high blood pressure patients than in those whose blood pressure is not so high. The arteries of a high blood pressure subject have been trained through years of resistance to take care of this pressure and the chances of rupturing a small artery are not very great. In fact, cerebral accidents in cardiovascular renal disease often consist of thrombosis of the diseased artery in a person with moderate pressure and we must abandon the purely mechanical conception of this matter. When we come to the transient paralyses and aphasias that are quite common in this group we like to believe as much as we can that they are due to spasm of the artery. We are forced to confess, however, that some of them are really slight hemorrhages or a blocking of a degenerated artery.

Blood pressure in acute disease has received an undue amount of attention and low blood pressure has led to much unnecessary worry. As a matter of fact, in very sick people low blood pressure is a conservative matter and when it has been proved that there is no lack of response to an actual demand for higher blood pressure it need not be treated to raise it. In fact, a high blood pressure is often more of an indication of failing circulation than low blood pressure. The reaction against circulatory failure by contraction of peripheral vessels is often Nature's warning of impending heart failure.

In cardiac disease the blood pressure is dependent more upon complications than upon the heart, except in aortic regurgitation when we get low diastolic reading and a large pulse pressure. In mitral stenosis without complications the pressure is ordinarily low. When there are complications it may be much higher.

High blood pressure is a symptomless condition and is present in a great many people who are entirely unconscious of its presence. These people have high pressure because it is compensating for some disorder. There is a strong feeling on the part of many clinicians that the kidney is the most usual site of the disorder for which high blood pressure compensates.

A nosebleed often calls attention for the first time to high blood pressure though the bleeding itself is usually occasioned by some slight ulcer or other lesion in the nose. Such an example of high blood pressure has been under my care for ten years after the nose bleed had drawn attention to it for the first time when the mercury stood at 240.

That blood pressure is a compensatory matter has received consideration from a great many medical philosophers. The parallel idea that arteriosclerosis is compensatory and that the bloodvessels thicken to prevent dilatation in high blood pressure has not been considered so often. It would be easier to carry this conception if it was not confused with primary disease of the bloodvessels. Primary disease of the bloodvessels constitutes an entity separate from the usual group of cardiovascular diseases.

Apparently, high blood pressure compensates in two ways. In the first place it compensates in supplying blood to the tissues that need the extra supply, either on account of diseases of an organ or because of an extra demand for activity of the organ. When compensation is successful there are no symptoms. When a person with blood pressure without symptoms comes under observation we discover it by the sphygmomanometer and we can judge the duration of the disease by the amount of hypertrophy of the heart.

The importance of a strict regimen for people with high blood pressure is not so much to improve their health at the time, for that is often good enough, but to prolong life and prevent future illness. You cannot permanently reduce blood pressure. You can depress it for a long time but that does not mean that it is cured. What we wish to avoid is degeneration of the bloodvessels leading to apoplexy and degeneration of the kidneys leading to Bright's disease. This is accomplished by a regimen involving diet, out of door exercise and intestinal hygiene. An important measure is the monthly dose of castor oil. If an inactive person who has a high blood pressure from any cause whatsoever does not alter his mode of life his kidneys are being damaged by the elimination of toxins that will continue until his diet is

changed and he helps the kidneys to function better by out door exercise. Even when there is definite evidence of arterial degeneration a suitable regimen will carry a person with a blood pressure of 180 or thereabouts for many years. Even when there is evidence of arterial thickening, as shown by examination of the bloodvessels, exercise becomes even more important. We need not fear the accidents that are so much talked about. People do not drop dead very often from cerebral hemorrhage due to exercise. Thrombosis is equally imminent in cardiovascular disease, and even though a percentage of deaths from cerebral hemorrhage should, on more critical examination, prove to be somewhat increased by exercise, nevertheless it is quite certain that the accidents due to thrombosis would be so much diminished that the average life of a whole group would be vastly prolonged.

ETIOLOGY

High blood pressure is more often found in men than in women, though, probably, extremely high blood pressure occurs more frequently in women. This is only an impression and not founded upon actual count. Heart disease seems to be a man's disease, in a way. At least my experience in heart work for the past sixteen years has shown a numerical predominance of men as patients.

Heredity plays a high part in producing blood pressure and here we must consider the possibility of a syphilitic taint.

Primary disease of the bloodvessels often exists without high blood pressure and as noted above has little to do with the toxic nephritic group of average practice.

The origin of high blood pressure is so much related to kidney damage that we cannot separate the two in a great many instances. But there are numerous examples of high blood pressure in which there is no chemical evidence of kidney disease. Experience has shown, however, that later the chemical evidence of kidney disease did appear. This makes it seem probable that it had previously existed without chemical manifestation.

It seems to me that a diagnosis of nonrenal blood pressure would have to be founded upon an elaborate observation of renal function and would certainly require a determination of the nonprotein nitrogen in the blood.

The effect of tobacco upon arteriosclerosis is dependent upon the fact that there is a rise of pressure of short duration. This follows smoking and probably does not do any mechanical harm. Excessive smokers very often have low blood pressures. This may be accounted for by the fact that people with low blood pressure get great comfort from the temporary stimulation that comes from the slight rise of pressure due to each indulgence. In advanced arteriosclerosis a person develops a distaste for tobacco. At this time, for some reason, the physiological effect becomes disagreeable.

In speaking of high blood pressure the question always arises as to what is the normal pressure. The rule of adding one hundred to the age is very comforting to older people, but is not agreeable to fact. This rule probably is harmless up to the age of thirty, but after that half a degree a year is all that can be added without departing widely from the results of the very elaborate studies made by the life insurance companies, who after all are the people most definitely interested in averages and they are without the personal bias of the physician who has to deal with the feelings of his patient. Wide experience and discussion have shown that in most instances the method used by applying measured pressure in the brachial artery gives a correct estimate in blood pressure. It is an important point not to take the findings of a single examination as being necessarily correct. It is shown, particularly in treating physicians, that at the first visit the blood pressure is almost certain to read much higher than it does subsequently. This is due to nervous apprehension which either raises the blood pressure or tightens the artery so that it is hard to compress.

Blood pressure has a personality of its own. It applies individually and it is necessary in these days when people pass from one place to another and one medical advisor to another that they should themselves know their blood pressure peculiarities. The patient must be taken into the confidence of the physician and trained how to live according to his needs.

The periodical examination, if it ever becomes universal, will of necessity do away with the concealing of people's condition from themselves. I have always thought that concealment was wrong and it has long since became inapplicable to metropolitan practice. I can imagine it being practised by a kindly physician who is a father confessor in his small community. This is impossible in metropolitan practice where each person is in contact with many physicians and where medical matters are much the subject of casual discussion and where a fair number of medical men have adopted perfect frankness as their motto. This frankness of physicians is only a counterpart of the frank relations that exist between people in general. The young people of today do not very long burden their souls with any of Nature's secrets.

TREATMENT

In the treatment of blood pressure there are two elements to be considered, the relief of such concomitant symptoms as the person suffers from and the treatment of the high blood pressure condition. The latter is the task that comes to the hands of the heart specialist, the former is more the task of the general practitioner who takes care of the person in the interval between his visits to the specialist. Hence, my interest has always been more in the general regimen than in the relief of particular symptoms.

The occasional use of high frequency electricity for the relief of symptoms is justifiable and nitrites are certainly useful. Nothing serves better than training the high blood pressure subject to use one two hundred and twenty-fifth of a grain of nitroglycerin on all those occasions when he finds by experience that it makes him feel better. A single dose of nitroglycerin is often effective in the insomnia of arteriosclerosis. In people who are under observation for long periods of time, when the opportunity offers, it is a good plan to ascertain what their reaction is to digitalis. Another drug which can often be used, experimentally, to advantage, is theobromine and sodium salicylate, in small doses, five

or ten grains three times a day. It seems to promote the well being of some people with high blood pressure conditions and in these small doses it does not irritate the kidney or produce a disagreeable effect. Sodium iodide also acts well and is agreeable to some people. The excessive use of iodides makes many people very miserable and does no good.

In writing on blood pressure one must ever warn one's readers they are dealing with a symptom and not with a disease. Disorders of the heart and circulation have occupied the thoughts of the best medical philosophers of each generation of physicians as they have come and gone.

In our time the mechanistic theory is giving place to one founded upon cellular pathology and the study of infections and disease has become a matter to be considered in relation to the whole life of the individual. We labor to adjust what we cannot cure. On this basis much has been accomplished in the last twenty years and we can look forward to great things in the coming decades.

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A Critique on the Determination of the Size of the Normal Heart by Röntgenology

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The many controversial formulæ, methods, tables, etc., for the determination of the normal size of the heart by röntgenology, all barren of any practical results, are of little value to the clinician in diagnosing cardiac pathology.

The röntgenologist as well as the internist fully appreciates that the normal size of the heart is so variable, and depends so greatly on the sex, age, height and weight of the subject, that it is necessary for a basis of normality to be established, as the slightest modification of its size may reveal an underlying pathological condition. Unfortunately, in determining the size of the normal heart, radiology is of little value, and the physician who must rely absolutely on the röntgen rays to map out the area for him, or to measure the size of the transverse or longitudinal diameters of that organ, will frequently be given data which will lead him into error.

The transverse or longitudinal diameters, or the area of the cardiac silhouette, prove nothing, and mean little in recognizing the normality or any slight but significant enlargement of the heart until a basis for determining the normal size of the individual heart is established. In other words it is impossible either by teleröntgenography or orthodiagraphy, both of which give practically the same results, to state with any degree of precision that the heart is normal or pathological in size. While not altogether subscribing to the extreme viewpoint of the illustrious cardiologist, Sir James Mackenzie (1), I am bound to agree with his statement, in so far as it applied to the determination of the normal individual size of the heart. He writes: "Indeed I am doubtful if an x ray examination of the heart has ever thrown the slightest light on a cardiac condition." And continuing, "Like the modification of the stethoscope, the modification of the x ray methods by orthodiagraphy and teleröntgenography has been of little practical use."

The following are important pitfalls in the path of röntgenologists, which they have not as yet been able to evade in determining normal heart size:

1. The failure in most cases accurately to outline the apex and the superior and inferior contours of the heart.

Usually if the heart lies obliquely in the chest, the shadow of its lower third portion with that of its apex is obliterated by the denser shadow of the diaphragm, liver and other organs. All radiologists who have made a study of the size of the heart acknowledge that this is a great and I may even say an almost insurmountable source of error.

Alfred Cohn says (2): "The difficulty of locating the apex precisely in a photographic plate makes the estimation of the long diameter inexact." And further: "To delimit the area of cardiac shadow requires that the extremities of the lines representing the right and left borders of the heart be joined by curved lines drawn *arbitrarily*. With experience these lines are properly drawn by different observers in a consistent manner, but no doubt each observer draws them differently. But the complete outline fails in exact representation also because of the difficulty, indeed often the impossibility of locating the apex in certain persons. On being able to locate this point accurately depends the value of the measurement, both of the long diameter and the area."

Bardeen (3) says: "An accurate outline of the apex is the chief difficulty that confronts one when he attempts to complete a line to the lower border of the heart."

Vaquez and Bordet (4) say: "It is only in the pathological condition when the shadow of the heart is very dense that one is in a position to mark on the tracings the lines D G, corresponding to the base, and D′ G′, corresponding to the inferior contour. In the normal condition this is not the case, and the construction lines are simply *interpretive*. And so the calculation of the area can be only approximate" (Fig. 1). And very recently Hodges and Eyster (19) acknowledge the following: "Most of the workers in cardiac röntgenology agree that when properly controlled, either teleröntgenograms or orthodiagrams will give a reasonably accurate measurement of the frontal plane of the heart, in spite of the fact that by either method, the upper and lower borders

of the cardiac silhouette must be completed *empirically.*"

Yet this portion of the cardiac silhouette approximating one half and sometimes as much as two thirds of the cardiac borders, which can only be made out as stated by Cohn "arbitrarily," by Vaquez and Bordet "interpretatively and approximately," and by Hodges and Eyster "empirically," is essentially necessary in delimiting the size, shape and position of the heart by radiology. This indeterminable and obscure portion of the cardiac shadow has been arbitrarily used in every formula for measuring the area of the heart. From this conjectural delineation of one half to two thirds of the heart's borders, conclusions are reached as to the normality or abnormality of its size. From such inaccurate, conjectural and frequently absolutely wrong premises it is impossible to arrive at accurate conclusions. Yet this is only one of the most patent difficulties which render so arduous an approximately correct measurement of the cardiac outlines with the röntgen rays.

2. Divergence of the rays is always an important factor of error in the radiological measurement of heart size and area. The size of the heart is thereby exaggerated; but were this degree of amplification constant and the same in all cases, it could be easily corrected and would be a negligible factor of error, but as this exaggeration varies with the size and position of the heart it produces an artificial enlargement of variable extent. Bardeen (3) asserts that the most practical distance for teleröntgenography is two metres; he also maintains that at this distance there is a sufficient dispersion of the rays to make it necessary to allow for enlargement of the heart silhouette. According to Vaquez and Bordet (4) the distance of one metre, a metre and a half, or even two metres, gives too considerable exaggeration of the heart silhouette. That it is only at two metres and a half that the exaggeration of the heart's shadow is reduced to its practical minimum, that is, the projection of an object fifteen centimetres in size, is augmented by only four or five millimetres.

The extent of the increase of the actual cardiac dimensions in teleröntgenograms taken at the same distance, depends upon the bulk, shape and deformities of the chest and the thickness of its walls; also it increases proportionately through the size and position of the heart. This amplification is greatly reduced in vertical hearts (the long narrow heart commonly called drop heart) and proportionately increased in horizontal hearts (the broad oblique hearts called the squatty heart). It is apparent that this exaggeration increases proportionately with the size of that organ, for the narrower its transverse diameter the less will be the amplification, the wider its transverse diameter the greater will be the augmentation of its radiologic area.

3. The influence of respiration on the size and shape of the heart is marked, and unless the subjects examined are invariably radiographed in the same respiratory phase, it may cause an augmentation of the radiologic cardiac area.

Neuhof (5) writes: "An added consideration, tending to lessen the value of measurements as comparative standards is the difference produced by movements of the diaphragm. When the excursion of the latter is limited, less of the heart is uncovered, its ovoid contour appears flattened, and the transverse measurement is correspondingly enlarged. With a mobile diaphragm the reverse is usually true. From all these facts it is apparently impossible to establish mathematical orthodiascopic standards of measurements. This statement, however, does not preclude such general conclusions as that "normal" hearts may be usually large or small, or pathologically enlarged hearts often overstep the somewhat ill defined limits. There is naturally no doubt of the value of orthodiascopy in the determination of the marked variations in the size of the heart."

The following taken from the authoritative work of Vaquez and Bordet (4) emphasizes the possibility of error due to the respiratory phase: "During deep inspiration the heart follows the movement of the diaphragm and is lowered. At the same time, the organ changes a little in form and its diameters vary slightly; the longitudinal diameter increases and the horizontal diameter diminishes; the result is an elongation and a narrowing of the shadow of the heart. During deep expiration the contrary is observed. Under the pressure of the diaphragm, the heart is raised and spread; both diameters increase, the horizontal more than the longitudinal. Here, for example, are figures noted in the case of a normal subject thirty years old:

Average respiration	*Forced inspiration*	*Forced expiration*
Longitudinal diameter in cm. 11.5....	11.8	13.5
Horizontal diameter in cm. 11.5.....	11.2	15.1

The preceding considerations bear only on forced movements of inspiration and expiration. If the respiration is quiet, the volume of the heart, as Groedel has remarked, "does not change notably" (Fig. 2). From the foregoing it is seen that the transverse diameter of the heart may vary two to three cm. between forced respiration and expiration.

4. Another factor which considerably influences heart size is the varied individual changes in the size, shape and position of that organ occasioned by its systole and diastole.

Eyster and Meek (6) describe a method of making rapid x ray shadowgraphs of the human heart with a casette changing mechanism allowing two exposures within the same cardiac cycle. From their observations made on the normal heart they state that: "The decrease in size of the cardiac area during systole may involve any of the outlines, but does not usually involve all. The outline corresponding to the right auricle varies least in position, while the left ventricular outline, particularly toward the apex is the margin which undergoes as a rule the greatest movement. The border of the right ventricle nearly always shows a descent at the base. The part of the left ventricular border may likewise vary. Usually the maximum change is at or near the apex and decreases upward, but the reverse may be seen" (Figs. 3 and 4).

These observations explain the fact that the difference between the size of the teleröntgenograph and the anatomical heart is much less in the vertical than the horizontal heart. The greatest change in the size and shape of the vertical heart due to its systole and diastole is at its lower curvature, the apex being more to the right and down. As the

eart increases its obliquity, this difference in its size ıcreases upwards and to the left. This can be easily emonstrated either by percussion or with the röntgen rays by pressing the lower abdomen, which ıuses the heart to rotate upward and to the left, ıd its transverse diameter to increase. As the car-

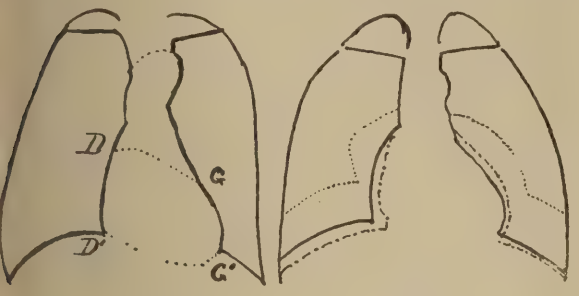

Fig. 1

Fig. 2

Fig. 1.—Orthodiagram of the heart and the large vessels in frontal sition. (*After Vaquez and Bordet*).

Fig. 2.—Black lines, quiet respiration; dotted lines, forced expiraon; dot and dash lines, forced inspiration. (*After Vaquez and ordet*).

ıac silhouette shows the heart in its diastolic aspect ıly, the changes caused by its systole must be ıerein included. This distortion in the cardiac ıadow cannot be contradistinguished or eliminated ıd thereby must be a source of considerable error determining radiologically the diameters, and the ea of that organ.

5. The shadows produced by extracardial structres, the pericardium, pericardial fat, and pericarıl bloodvessels are considered by radiologists an ıtegral part of the heart's silhouette, and they ignore ıe influence of this factor in the magnification of ıe size of that organ.

Hirchfelder (7) says that fat may be deposited in ıe heart in solid masses of adipose tissue, especially the pericardium in fat individuals, and particularly ı those addicted to alcohol, and it is very often assoated with coronary sclerosis. This condition is esignated as fatty infiltration or obese heart. He so mentions that in normal hearts there is a conderable amount of fat thirty to sixty grams (one to vo ounces), collected just below the endothelial yer of the pericardium, along the auriculoventricur and interventricular sulci, at the base, and scatred elsewhere over the heart. It has been shown W. Muller (8), Hirsch (9), Kirch (10), that the eight of adipose tissue may actually exceed the eight of cardiac muscles. G. Schwartz (11) called tention to this source of error from a radiological ewpoint and proved that the left cardiodiaphragatic sinus, instead of being clear, is filled by a ıadow, less heavy it is true, than that usually cast the heart. This he proved to be due to the presıce of fat.

The said fatty cushion surrounding the apex is also stinguishable from the cardiac tissue by percussion. This element of error will not invariably amplify e size of the cardiac silhouette and the extent of is exaggeration being so inconstant that it is beyond e scope of definite corrections. While this amplıation in some cases may be a negligible factor, yet other instances it may explain the great differences the size of the normal radiological heart. These elements of error and many others not enumerated in this article are the reasons for the difference in the size of the transverse diameter of the normal heart of the anatomists and of the röntgenologists.

The size of the transverse diameter of the normal heart handed down by the great Bouillaud (12) in 1841, and confirmed by other anatomists, averages approximately 8.8 cm. at its broadest. The greatest breadth of the normal heart, according to Gray (13) is 8.9 cm., according to Piersol (14) 9 to 11 cm., and to Morris (15) 8.7 cm. The radiological dimension of the transverse diameter of the heart is, according to Claytor and Merrill (16), 10.7 cm. to 13.8 cm. in men weighing from 108 to 181 pounds; according to Moritz (17) 11 cm. to 15.5 cm. in men between the ages of seventeen and fifty-six years; according to Lutembacher (18) 11 cm. to 13 cm. in men up to fifty years of age; to Bardeen (3) 11.4 cm. to 14.4 cm. in men weighing 100 to 200 pounds.

A consideration of the numerous statistical studies on the size of the normal heart, as determined in orthodiagraphy and teleröntgenography not only by the authorities quoted above but also by other röntgenologists, gives the dimensions of the transverse diameter to be from 10.7 cm. to 14.4 cm. If this difference between the dimensions of the transverse diameter of the anatomical and röntgenological heart were unvaried and equal in every case, or even in any one group of cases, then it would be a simple matter to make the necessary corrections; but as this difference is always variable and depends on so many conflicting factors, it must remain an outstanding insurmountable difficulty to determine accurately the standard size of the individual normal heart by röntgenology.

We can safely predict that unless these sources of error are corrected all attempts to determine the normal transverse diameter of the heart, which is the

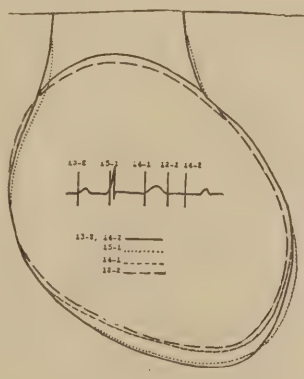

Fig. 3

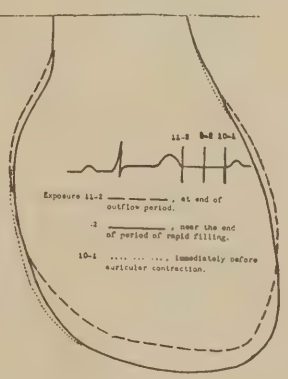
Exposure 11-2 ——— , at end of outflow period.
, near the end of period of rapid filling.
10-4 ..... , immediately before auricular contraction.

Fig. 4

Fig. 3.—Changes in outline of human heart during contraction. (*After Eyster and Meek*).

Fig. 4.—Filling period of human ventricles. The three x ray exposures were made as shown by electrocardiograph record. (*After Eyster and Meek.*)

only diameter which can be actually delineated and not guessed at from the röntgen silhouette, will be unsatisfactory and barren of conclusive results. And as even this diameter cannot always be correctly determined from the cardiac silhouette, it is evidently impossible to compute with any degree of exactitude the area of the volume of the heart by radiology. In consequence it can be asserted that a very large

percentage of the cardiographs, either teleröntgenography or orthoröntgenography, are useless and even misleading.

Hodges and Eyster (19) have recently written: "The use of the röntgen ray is therefore clearly applicable to the study of the changes in heart size in a particular individual, and it is only when we come to the subject of absolute size that serious divergence of opinion exists. Some workers hold with Bertnard Smith that the size of the human heart is delicately adjusted to stature and body weight. Others, like Smith and Bloedern, feel that individual variations are so great as to make the method entirely useless. Still others, among them Bardeen (3), feel that while certain variations from a mean size have to be considered, sufficient accuracy is obtained to be of practical value."

As long as there exist the cardinal factors of error enumerated above, which are the basis of all formulæ, tables, etc., for determining the exact size of the normal heart by röntgenology, so long will this means of estimating the normal cardiac size, area and volume in men be fallacious, misleading and inaccurate. This statement is applicable also to the latest contribution on this subject by Hodges and Eyster (19). They summarize their work as follows: "New tables are given for the estimation of normal cardiac area in men. These are derived from the formula: Area in sq. cm.=age 0.0204=stature 0.8668+weight 0.337 minus the constant 63.8049. If the heart is found to be seven square centimetres larger than the predicted area the chances are three to one that is actually enlarged. With fourteen square centimetres the chances of pathology are ten to one, and with twenty-one square centimetres, forty-five to one."

Their formula is based on the same sophistry, because they qualify their conclusions with the statement that the "upper and lower borders must be completed *empirically*," and also by "after correction for the distortion due to divergence of the rays."

How can the size of the normal individual heart be determined? Is there a basis by which it can be ascertained? In a previous article I have endeavored to show that percussion gives an accurate delineation of the heart size, shape and position. A tabulation of the normal hearts of two hundred and fifty-seven soldiers percussed standing showed that the total average of the size of the transverse diameter of those organs to be 9 cm. and of the longitudinal diameter 9.27 cm.

The transverse diameter corresponds to the greatest width of the heart, and the longitudinal diameter begins at the intersection of the right contour of the heart and the origin of the great bloodvessels and extends to the apex. It was noted that the dimensions of the transverse diameter of the heart at its broadest corresponds to the measurement of this same diameter given by anatomists.

The most important diameter of the heart is the transverse, the longitudinal is important only in so far as it agrees with the size of the transverse. A heart well supported by the diaphragm and lying obliquely will have a transverse diameter about equal to the longitudinal, but a heart that is pendulous and elongated, as is commonly found in the hyposthenic or splanchnoptotic type of person, will have a larger longitudinal than transverse diameter. These obse vations are confirmed radiologically by Vaquez an Bordet (4), who write: "In the recumbent positio as we have said, the two diameters, longitudinal an horizontal, are perceptibly equal. Sometimes, hov ever, the first is greater than the second by from fiv mm. to about one cm.; in exceptional cases it is les by several millimetres. In the standing position, th longitudinal position may be increased a little, whic is, however, very rare; on the contrary, the horizo tal diameter always diminishes. It then becom inferior to the other by from five mm. to one cm.

Percussion (20) gives two distinctive lines of du ness, one corresponding to the x ray silhouette of th heart and the other to a more pronounced area d dulness, the size of which equals the normal hea size during its systole; the former corresponds to th heart's margins as mapped out by the x rays, an represents the heart in diastole, together with i pericardial appendages, including extrapericardi fat and bloodvessels, and is subjected to the sam inaccuracies and is just as unreliable in its resul as the x ray silhouette. This difference between th two margins of dulness is wider usually on the le heart border than on the right. As in the röntgen graph, and for the same reasons, it varies in size i different persons when delimited by percussion. Th difference may be as much as 1.5 cm. to three cm. persons having a high diaphragm in whom the hea lies obliquely; it also diminishes in size in perso having a sagging diaphragm, which causes the hea to assume a more vertical position. Therefore, th only practical way of delineating the size of the no mal heart must be during its systole; this can b easily done by percussion, and only with extrem difficulty by röntgenology.

From an observation of many hundreds of norm hearts during the past ten years, in nearly every ca I have found a constant correlation of the size of th fist to that of the heart percussed in systole (its inn margin of dulness); in other words, there is a ve close approximation of the size of the clenched fi to that of the heart in systole. This was first o served by Laennec, and is confirmed by more mode authors on anatomy. Davis (21) says: "The hea is somewhat larger than the clenched fist." Cunnin ham (22) writes: "It is roughly estimated as bei about the same size as the clenched fist." The clo approximation of the size of the normal percuss heart in systole to the measurements of that org given to us by anatomists has been mentioned befo in this article.

The transverse diameter of the heart correspon to the linear measurement of a line beginning at t junction of the inner side of the right clenched f and the wrist, and ending at the middle joint of t fourth finger (23). The stature of a person, t work he performs, bears a close relationship to t size of the hand. This measurement is an accura factor in determining whether the heart is normal size or whether there is a slight modification in t measurement of its transverse diameter. As the d termination of the size, shape and position of t heart is a dominant factor in the diagnosis of pathological condition, this method has proved great importance in the recognition of cardiac d eases.

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A Case of Transposition of the Great Vessels of the Heart With Atresia of the Aortic Orifice

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Case.—A male baby apparently normal until late the second day of life. At that time he grew restss and gave repeated shrill cries. Later his breathg became labored and rapid, reaching seventy-six spirations a minute. He was pale, only slightly anosed, and the temperature fell to 96° F. Stimution increased the temperature but other symptoms mained, and he died early the next morning with morrhage from the nose and mouth.

The mother was colored, thirty-one years of age, ho had had eight children. Of the other children, e are living and well; two died of influenza in)18. There was no history of miscarriages. Wasrmann was negative. This pregnancy was uncomicated and the delivery was normal.

Autopsy revealed marked congestion of liver and leen, with petechial hemorrhages in other abdomal organs, but no abnormality in formation of these gans. The thymus was enlarged, the gland weighg thirteen grams, and was increased in size, chiefly the anteroposterior diameter. The lungs showed arked areas of congestion. The heart was dilated, tending from the midclavicular line on the right the midclavicular line in the fifth interspace on the ft. There was edema of the brain but no hemorage.

On special examination, the heart was found to nsist of a broad base and rounded apex, the latter ing composed of the left ventricle. In the right per quadrant of the anterior surface there was a oove running obliquely downward from left to ght. This marked the interventricular septum cutig off a muscular shoulder which represented the lastic right ventricle. The two great trunks nerged from the anterior surface of the base in the median line between the two auricular appendages. The trunk occupying the position normally occupied by the pulmonary artery emerged from the conus of the right ventricle in the median line and passed directly upward for a distance of 2.5 cm. There it gave off three branches to the head and upper extremities. It was a small, thin walled trunk measuring 0.75 cm. in circumference, and was the transposed aorta. On laying it open two large branches were found to rise from the coronary sinuses and pursue the course of the greatly dilated right and left coronaries. The aortic orifice itself was atresic, the valves being fused along their contiguous margins except for a small central chink which was blocked by the musculature below.

The transposed pulmonary artery arose directly to the left of the aorta on a slightly posterior plane. It passed directly upward, giving off a large branch to either lung and then continuing onward through a wide channel which represented the patent ductus arteriosus, to form the large descending thoracic aorta. The patent ductus and the small transposed aorta joined each other at an acute angle.

On laying open the heart, the right auricle was found to be hypertrophied and dilated and presented a large patent foramen ovale. The tricuspid orifice was aplastic. The right ventricle showed an aplastic cavity about 1.0 cm. in diameter with musculature 1.25 cm. thick, yellowish in color and apparently diseased. The conus was obliterated. The left auricle was dilated but smaller than the right. The mitral valve was normal. The left ventricle contained a large roomy cavity with a wall 0.5 cm. thick. The pulmonary orifice was 2.75 cm. in circumference.

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The Use of Diathermy in Cardiovascular Diseases

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GENERAL EFFECTS OF DIATHERMY

Before we discuss the application of diathermy and the effects produced by it in this group of diseases, I wish to state the effects of diathermy in general and how these effects are produced. .

The effect of diathermy is in the first place perceived and demonstrated as a warming up of all the tissues through which the current passes. The rise in temperature is from one to seven degrees F., in my experience; others have observed still higher values. The warming up is accompanied by a marked hyperemia embracing all the tissues. The main action of diathermy is due to the active hyperemia it produces. Bier describes the action of active hyperemia as stimulating resolution and absorption, as analgesic and as bactericidal. All these effects can be achieved by an active hyperemia produced by any means, as by the direct application of heat, the difference being that with the direct application of heat, whether by means of hot compresses, a hot water bag, or hot air treatment, reddening of the skin is greater; hence the hyperemia of the skin is more intense. When diathermy is applied, the skin is only slightly reddened, or sometimes not at all. This leads to the conclusion that in the latter case the heat is distributed into the deeper tissues. This can easily be proved by the fact that after a transverse application of diathermy to the pelvic region, with electrodes of equal size applied in front above the symphysis pubis and in the back directly opposite this one, an increase in the temperature will be registered by a thermometer inserted in the rectum or the vagina, although the skin may show little evidence of hyperemia. Many more observations and experiments could be cited to prove that diathermy produces an intensive active hyperemia in the deep tissues, but suffice it to say that, in comparison with the direct application of heat, diathermy produces a hyperemia which penetrates all layers of tissues and organs with much better control as far as the intensity, the location and the direction of the desired hyperemia is concerned. The patient experiences no pain, not even the slightest discomfort, while being treated, nor are there any undesirable after effects.

The electric current as such has only a secondary action. The stimulating and chemical action characteristic of the galvanic and of the alternating currents of low frequency (faradic and sinusoidal) are totally absent in this form of electric current. But the high frequency current has an analgesic effect. It is possible that the analgesic effect of diathermy is partially due to the high frequency current, as is evidenced by the fact that the nonheat producing, pure D'Arsonval current is also analgesic in its action. This point of view is strongly defended by Kowarschik of Vienna. That there is an effect due to the electric current is still more plainly evident when we remember that the pure D'Arsonval current reduces high blood pressure to almost the same degree as does the application of general diathermy.

These facts should convince us that the action of diathermy is due first to the hyperemia it produces and, in a lesser degree, to the electric current. It is selfevident that if the action of diathermy is mainly due to its ability to produce a hyperemia, then its effect upon cardiovascular disturbances must be considerable. Truly we have a great number of these disturbances benefited by the action of this modality of the electric current.

DIATHERMY IN HEART DISORDERS

Let us now first consider the diseases of the central circulatory system and then of the peripheral. Of the diseases of the heart those that are accompanied by pain are readily amenable to this form of treatment. Cases of myocarditis due to disturbances of the coronary arteries are the first to be considered. Cases of myocarditis of not long standing, accompanied by a feeling of oppression, painful sensations around the cardiac region, and occasional attacks of angina pectoris, are benefited by this form of treatment. It may not be successful in one hundred per cent. of the cases, but in each and every case included in this category diathermy should be given a trial, especially when about five treatments will undoubtedly tell whether a course of treatments will be beneficial or not.

There are certain symptoms and physical signs which, after five treatments, will be a positive indication of the advisability of continuing the treatment. If there is a partial cessation of painful sensations and of oppression; if there is a lowering of the pathologically increased blood pressure, not only after each treatment, but is also less at each consecutive treatment, so that there is a steady lowering of the blood pressure value without exaggerated fluctuations, we may be sure that we are dealing with a case that is going to respond. If these things do not occur nothing should be expected of the treatment and it should be discontinued.

The following is the technic of the procedure. Two metal plates of nearly equal size should be used. The slightly smaller one, four by six inches, is placed in front over the precordium, and the larger one, five by eight inches, in the back exactly opposite the first one, the patient being in the prone position. The current applied should not exceed one ampere even if the patient does not feel the heat, as the maximum dose is unnecessary and might even be harmful. The duration of the treatment should be from ten to fifteen minutes, never longer. The patient should be allowed to rest one half to one hour after the treatment. The pulse should be counted and the blood pressure taken before and after treatment. The pulse rate increases in some cases after the application and the blood pressure is lowered in all cases. The treatment should be given every other day and the entire course of treatments in the responsive cases should number twelve to twenty until the symptoms subside.

The same technic is also applicable with good re-

sults in cases of valvular diseases accompanied by pain, and in cases of chronic pericarditis with adhesions. In the latter cases a trifle stronger current may be used, and the treatment may be continued for a longer period if necessary.

DIATHERMY IN HYPERTENSION

The effect of diathermy on high blood pressure has already been mentioned in connection with coronary disease. There is no doubt that a reduction of high blood pressure follows this treatment. The treatment is especially of great value in the early presclerotic cases with moderate tension, as without doubt it postpones the sclerotic stage for many years. It is understood that cases of hypertension due to a certain definite anatomical cause, such as aortic aneurysm, no permanent objective results are to be expected, although certain temporary improvement of subjective symptoms such as pain oppression and sleeplessness occurs.

The best method of applying general diathermy is by the contact method, by means of five electrodes. One square electrode of a large size is placed on the back of the patient and is connected to one pole, and the other four are placed in the form of cuffs one on each extremity, and all connected with the second pole. General diathermy can also be applied by means of Dr. Schnee's four cell bath. By these two methods we achieve a relaxation of all the peripheral bloodvessels and the blood stream gets the most heat. The heat is then carried by the blood stream throughout the entire body. That the bloodvessels are getting the most heat can be proved by the fact that a thermometer held in the axilla near the artery will register a much higher temperature than a thermometer inserted into the rectum.

There are two other ways of administering general diathermy; first, autoconduction by means of the autocondensation pad, and secondly, the induction method, by means of a solenoid. By these two methods much current is being wasted and they should only be used if exudates of large capacity are to be affected, which could not be treated by the contact method.

The duration of the treatment by the contact method should last at the beginning fifteen minutes, then twenty minutes, then twenty-five to thirty minutes, and two and one half amperes can be given without any untoward effect. The course of treatment should comprise fifteen to twenty treatments.

Arteriosclerosis of the abdominal vessels is to be treated in the same way as coronary diseases, with the electrodes placed one on the abdomen and the other on the back, one and one half amperes for fifteen to twenty minutes should be given for fifteen to twenty treatments.

PERIPHERAL DISTURBANCES

The following cases of disturbed peripheral circulation are amenable to treatment with diathermy.

Different angioneuroses, frost bite, habitual cold hands and feet, angioneurotic edema, elephantiasis, Raynaud's disease, endarteritis obliterans, and thromboangitis obliterans.

There are two classes of angioneurosis. The first is characterized by an exaggeration of vascular tonicity—angiospasm—and is accompanied by paresthesia and pain, and the second is characterized by a lowered tonicity—angioparesis—recognized by cyanosis, sensations of cold and other sensory disturbances, which in their further development may lead to serious disturbances, such as trophic changes and eventually to gangrene (Raynaud's disease).

Frost bites resemble, clinically, angioparesis and may exhibit all the symptoms; in mild form, cyanosis and sensations of cold, tingling, etc.; in more severe cases, trophic changes, blebs and ulcers, and in the extreme cases, gangrene.

Habitually cold hands and feet belong also to the group of angioneuroses, as does also angioneurotic edema.

Elephantiasis, the sporadic type, which usually starts from some circulatory disturbance which leads to the disturbance of the lymphatic circulation, is also amenable to this form of treatment, as there is also an increased circulation of the lymph, with the hyperemia.

Erythromelalgia which also belongs to this group of vasomotor disorders, might be responsive to the treatment with diathermy.

Raynaud's disease, a vasomotor disorder without organic disease of the vessels, responds quickly to diathermy. Subjective symptoms disappear first, then mobility becomes easier, then cyanosis disappears. In the more severe types of the disease we can postpone gangrene for many years. The treatment has to be continued for many months.

Endarteritis obliterans—no matter whether found in elderly persons, in diabetic subjects, or in connection with arteriosclerosis due to any cause whatsoever—responds to diathermy. The symptoms in these cases are: feeling of cold, discoloration of the skin, cyanosis, pallor or redness, tingling, numbness, pain in the muscles, interference with motion, such as intermittent claudication, and finally trophic changes from blebs, fissures, ulcers, gangrene. These patients without treatment or even sometimes with treatment, are growing progressively worse. There is a definite pathology of the bloodvessels, starting in their adventitia and leading to the obliteration of the lumen.

All the cases of this group respond to the treatment under discussion, as long as the pathological process involves only the arterial side, without any evidence of an involvement of the capillary or venous systems, such as numerous nets of collateral, distended or thrombosed venules or veins on the skin. When the skin of the involved extremities shows such veins—in my experience—no relief can be expected from diathermy. In other words, we can lay down the following rule: All cases of endarteritis obliterans will respond to the diathermy treatment so long as the pathological process is limited to the arteries, without the involvement of the capillary or venous systems.

The technic of applying diathermy in all cases of peripheral circulatory disturbances is by means of the longitudinal method. In the longitudinal method of application, in contradistinction to the transverse method, in which the current is forced to pass through all the tissues and the tissue of the highest resistance gets the most heat, the current follows the paths of least resistance and these get the most heat. As the paths of least resistance are

the blood and the bloodvessels so it is evident that we are attacking the seat of the trouble.

The strength of the current is anywhere between 0.3 to 0.7 A. and the duration fifteen to twenty minutes. The treatments are being given daily at first, and then every other day and finally twice a week. A series is twenty treatments, which may be repeated if symptoms recur after a certain time.

In conclusion let us consider the physiology of the action of diathermy in vascular disease. In all probability the course of events is as follows: the blood is the carrier of the heat produced. The blood gives up its heat to the vascular walls, which contain the sympathetic nerves. These in turn are very sensitive to heat as they have no sheaths and react to the warmth by relaxing the vascular walls. This relaxation causes also a widening of the lumen of the vasa vasorum, and the vascular wall gets more nourishment and is kept in a healthier state than before. A more normal vascular wall responds more normally to the nervous and chemical impulses and hence the benefit of this treatment in the above mentioned disturbances. The action of diathermy rests on a definite physiological basis and is not suggestive, the best proof being that no purely nervous disorder of the heart responds to the treatment.

Vascular Disturbances

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The periodical examination made on Army officers affords an unexcelled opportunity to measure the consequences resulting from stress and strain. Individual examples from our former statesmen are tragically impressed upon our memory. It seems that the demand of modern civilization is so complex that only supermen can continue at the helm of the State, and they too soon give out unless we can further fortify them against the consequences of stress and strain. A short while ago preservation of the human race demanded that medical science conquer the problem of contagion; now the major requirement is that medicine cope with the preservation of virility and extend the same beyond those years now known as middle age.

To this problem such observations as have just been made must lend much that is of import. The general findings quoted show a diminution in ability for sustained effort both physical and mental. In the more severe cases the effects seem to gravitate into the realm of the neuropsychiatric. The only constant prevailing objective sign so far disclosed points to a disturbance in the vasomotor sphere. This is interesting because the final ravages of stress and strain are admittedly written in retrogressive changes in the median coat of the bloodvessels (1). The observations referred to simply reveal morbid disturbances at the same site, but at a far earlier stage. This is certainly a logical relation since the admitted change in the muscle media must at some time exhibit a dynamic impress preceding an anatomical one, one manifested by distorted contractions. Where we formerly wrote sclerotic, we now say dynamic, the condition met with in early stages.

The tendency to weld clinical practice and anatomical diagnosis into one concept and terminology is based on a laudable desire for exactitude. In the field of contagion, because microbes from the start leave their impress through anatomical changes, this welding process was desirable; but in this new field of conservation we are concerned with disease manifestations that have yet to leave their imprint on anatomy until a later stage. When we examine writings on arteriosclerosis, we find ample confirmation of this practice. The richness of pathology of that disease is in marked contrast to the paucity of information concerning pathogenesis and what can be accomplished in therapy. If we are to cope with arteriosclerosis it must be at a period before there is little or any change registered in anatomy. The median coat must, therefore, be the pivotal point around which studies will centre and such studies will be concerned not so much with anatomical appearance as with muscle reactivity.

Such muscle as goes to make up the median coat takes part in the formation of five major systems: alimentary, bronchial, vascular, genitourinary and uterine. The similarity in structure of those muscle systems is in marked contrast to the dissimilarity in reactivity to disease and to drugs. Adrenalin, for example, exerts a marked tonic action on the bloodvessels, a slight action on the alimentary muscles and an opposite action on the bronchial system. Pituitrin exhibits its greatest tonic action on the uterus and intestines. The more we study, the more markedly is this selective action of chemicals on smooth muscle disclosed (2). If we further consider the phylogenetic history of these fibres we find them the primordial structure of that group, neuromuscular, the seat of a triangle of functions known as conductivity, contractility and irritability. Even in the human ureter the muscle fibres preserve this primordial, cell to cell conductivity. But before this type of conductivity is established it is preceded by a system of conduction by specific chemical substances, as stimuli, which reach their objective through the circulation. Thus, chemical stimuli and muscle response are the forerunners of what later becomes a complex nerve muscle system. As with conductivity, so with this primitive system; smooth muscles preserve it in an unchanged reactivity to chemical influences. It is this conception that we seek to stress because once established it brings the bloodvessels into the position of a barometer for chemical imbalances which eventually result in a loss of virility that permits of no restitution.

It is true that every cell exhibits a chemical reactivity, at times specific (3). Uranium picks out the kidney cell and produces the symptom complex of

nephritis. One also meets with group characteristics. Certain chemical radicals (somnifacients), reacting on the nervous system have their activity enhanced in proportion as their compounds are miscible with lipoids. The endocrines, too, show a reactivity to chemical influence. The iodine intake affects thyroid activity. We stress the reactivity of bloodvessels because it is more clearly depicted in recognized symptom complexes; and in addition, the chemical problems involved are less complex.

The interrelation of chemical and symptom complexes is of supreme importance in the study of certain somatic disturbances (4). In certain fields chemical progress has reached the point where analysis alone can make the diagnosis of a disturbance before it is clearly impressed on the clinical symptoms (basal metabolism). So sensitive is chemical diagnosis when properly developed that it detects disease at a period in which therapy is far more applicable. The problem of vascular disturbances is not fortified with a chemical understanding so applicable. We must depend on the combination of symptoms and our chemistry will generally prove to be suggestive rather than conclusive.

Symptoms provoked by vascular disturbances derive little elucidation from direct observation on the vessels. By analogy we would expect three degrees of reactivity: collapse, tone and spasm. Intermediary we recognize hypotone and hypertone, and two types of spasms—one sustained or tonic and the other intermittent or clonic. These degrees and types are well recognized in the alimentary canal. Furthermore, a study of the sense perceptions registered concurrent with changes in the degrees of alimentary muscular reactivity reveals a striking parallel, ranging from the realm of the subconscious through appetite, hunger, to pain (5). The explanation of this phenomenon is a task for physiologists. Our problem is to determine whether this principle is applicable to bloodvessels. If so, vascular reactivity of itself, registers in part at least its own symptomatology as well as those secondary symptoms which result from the disturbances within the organs the seat of vascular reaction. Shock is associated with collapse and spastic bloodvessels originate pain (migraine). Furthermore, vessel tone falls with a rise of hydrogen ion concentration, at least within certain limits. This is interesting as in many cited cases of asthenia symptoms, fluctuating with a variation of hydrogen ion concentration, are exhibited.

The secondary disturbances in the function or in the state of being of an organ, the seat of vascular distortions, are not uniformly distributed, but depend upon the part played by the vascular supply. Thus, not all tissues are equally dependable upon the blood supply for nutrition. The brain perishes in a few minutes, while bone retains its vitality for hours. Hence, it is in the nervous system that these secondary disturbances should predominate. So prompt do nutrition disturbances follow interruption of the brain blood supply that a train of symptoms is soon encountered quite suggestive of such symptoms as are met with in sclerosed bloodvessels. In addition, the vascular system plays an important part in heat regulation, and thus comes in close relation to the splanchnic area and the muscle system, in which regions symptoms are prone to appear. Blood profusion determines excretion and blood supply fluctuations will effect variations in excretion (urine). The problem is approachable from an entirely different angle, namely, a comparison with those symptoms following sclerotic changes. A close parallel is observed. Certain organs, however, like the kidney, bear a double load of vascular disturbances and direct insult of the fundamental chemical distortion. Brain, heart, muscle, splanchnic area alike are sclerotic and dynamic disturbances are the systems most frequently involved in symptomatology.

1. Symptoms in the central nervous system: sensory—cranial and optic migraine, tinnitus aurium, vertigo; motor—transient and mild disturbance of accuracy, skill and coordination; reflex—generally heightened; psychic—asthenia, inability for sustained effort, attention below par and frequently forced, memory for recent events for the same reason below par; insomnia. Insight is excellent and the patients detect something wrong long before it is manifest to others. Keen insight produces anxiety which can be augmented to phobias. We are constantly meeting with patients who after the correction of chemical imbalance, cannot tell what they worried about.

An extensive experience (war) with the cardiovascular systems disclosed an intimate association between tachycardia and vascular instability. Later we found an associate chemical imbalance in many cases. Any change in vascular tone in one area not compensated by a complementary change in another must throw the heart out of rhythm, just as a slipping of a clutch causes the motor of an auto to race. Fluctuations in blood pressures are met with along with cold extremities, hot and cold flashes and cold sweats (6).

Instead of claudications we meet with ill defined muscle aches and pains which when improvement parallels restoration of the chemical balance, we are tempted to attribute to a primary vascular disturbance. The splanchnic area is the seat of various disturbances formerly called dyspeptic but now described by a term of less meaning, neurotic. We know that some of the parenteral ferment activities (glycogenetic), are repressed during chemical imbalances. If a similar repression occurs in enteric processes (such as change from zymogen to enzyme) we can better understand the frequence of digestive disturbances.

The phobias encountered may rise to a level of a true psychosis, but no patient should be classified as psychotic until he has been proved to be free from chemical imbalances. The psychoses are a tertiary reaction and further complicate the symptomatology (7).

The study of chemical complexes at once involves us in difficulties that arise by reason of the shortcomings in medical chemistry. Deviations from normal chemical proportions or the occurrence of foreign substances we call chemical imbalances; where several of these chemical distortions are associated with definite and related symptoms we denote such a chemical condition as a complex (state of basal metabolism). The major portion of medical chemistry is limited to imbalances. In two instances (thyroid and pancreatic diabetes) the chemical findings are so conclusive as to constitute a complex.

Certain chemical findings quite constant and suggestive are met with in rabbits whose livers have been partly destroyed by an infecting coccus (coccidium hepatis). These show a low alkali reserve due to an accumulation of aminoacids, which the liver fails to convert to urea. Sugar curves are disturbed, high levels quick to appear and sustained on feeding while low levels predominate in starvation. Insulin fails to desugarize the food in proportion to its dose. These sugar abnormalities are laid to a repression of the glycogenetic function. Furthermore, the nervous instability of these rabbits and the ease with which they tire are suggestive of symptoms encountered in individuals with like chemical findings. In view of the importance of the liver the development of chemistry to a point where we can possess knowledge of a chemical complex indicative of liver deficiency (as we now have for the islands of Langerhans) will be a decided advance.

The study of chemical imbalances is inseparably connected with symptomatology, uncorrelated with symptoms they have a questionable significance. A better understanding of these imbalances and certainly a rational therapy will follow a knowledge of the provoking causes. Exogenous sources arise from the ingesta either through deficiency (iodine deficiency in goitre, avitaminosis) or from substances rendered toxic without the body as the diamines or ptomaines. The ingesta is also subject to bacterial activity within the food passages, wherein substances arise provoking a chemical imbalance. The bacteria may fasten themselves on these passage walls as focal infections, discharging substances provoking chemical imbalances or they may invade such chemical laboratory as the liver (see above) and provoke chemical distortions of great magnitude. These bacteria are markedly characterized by their habitat. The performances of the intestinal group are further complicated by the arrangement of the portal stream which brings the liver markedly under their influences.

The bacteria of the air and genitourinary passages concerned with the causation of remote effects, are dominated each by a morphological group, pneumococcic, streptococci, and the colon group, respectively. The part played by focal infections of these groups on vascular disturbances has been well demonstrated (8). Thayer has described such disturbances in typhoid and we encountered in convalescents from influenza numbers who showed transient and very debilitating attacks of tachycardia with a high blood pressure (approaching 170).

Morphological studies of the intestinal flora fail to simplify the complexities of intestinal infection, as is the case with air and urinary passages. To cut the Gordian knot we proceeded with biochemical investigation, making comparative analyses of the gases derived from incubated stools and those obtained direct from collection of the flatus (9). The noted differences we interpreted as due to changes in the active flora in response to change in the oxygen tension. If such a hypothesis is correct, augmenting the oxygen tension involved should reduce fermentation, and this can be proved to be true. So while affording no morphological group that dominates bacteria growth it may prove that a biochemical group dominates the intestines. Another phenomenon came to light during extensive fluoroscopic studies, namely, barium patches persisted at sites where a gas bubble and signs of muscular distortions had been observed. This was interpreted as dependent upon some epithelial reaction. No parallelism could be established between the intensity of the fermentation or muscular distortions, and the severity of remote symptoms.

The determining factor we were led to attribute to the state of the epithelium which stands between the heterogeneous mass of putrid products and nutritive products on the one hand and the liver on the other. Once this epithelium becomes remiss in its duty the liver functions deteriorate. Both epithelium and liver have the same phylogenetic origin and retain many parallel functions. Colitis need be no more exudative than rhinitis and both show a dry type with adherences, a type McCollom described in his studies on the colon. As a corollary we must look to the restitution and preservation of this epithelium as an indispensable factor in therapy at least at one stage of chemical imbalances originating from intestinal fermentation. The removal of bowel contents to the further deterioration of epithelium is a costly procedure. Thus, what starts out to be a problem concerned with bacteriology soon becomes complicated by many chemical and physiological factors.

Chemical imbalances arising from endogenous sources are traceable to three factors: a, such toxemias as pregnancy produces; b, parenteral digestion (protein fevers, traumatic fevers, anaphylaxis); c and primary metabolic disturbances (cretins, involutional states). The field of parenteral digestion is a pauper among the rich fields of immunology. Parenteral digestion of large exudates (autolysates) greatly enhances both the morbidity and mortality of primary infections and sterile autolysates can be shown to be more lethal (through vasomotor collapse) than the infected exudate from which they are produced.

When our knowledge of chemistry increases we will have a better therapy for some of the baffling problems in infections. Metabolic disturbances secondary to chemical imbalances (iodine deficiency and goitre) or bacterial invasion (see above, intestinal fermentation), add complexities to these factors yet are better subject to comprehensive analysis than those arising primarily (i. e., the involution states).

It remains to interpret those chemical findings which deviate from normal but whose correlation to disease wants further elucidation (chemical imbalances). In establishing that correlation to disease a helpful criterion lies in the determination of whether or not progress in therapy is accompanied by approach to chemical norms, i. e., if we are to use, say the alkali reserve as an index of disease the severity of the symptoms involved should fluctuate with alkali reserve. Our experience with many cases of migraine verifies this principle. In certain cases we can predict a migraine attack or its recession by chemical determinations. Chemical changes seem to keep one jump ahead of symptoms. Another helpful guide lies in the determination of the causative factor.

(To be concluded)

Historical Medicine

Living Long and Breeding Well as Plato Saw It and as We See It

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The perusal of a book (1) on the legend of Socrates and the origins of Plato a short time ago moved me so that I sat down to write an eulogistic criticism of it. It seems as though some one should write such a book or a book with such a subject at least, but as I read I found my criticism running into a vein not entirely eulogistic. Gradually the prejudice I have shared with the world for Plato and which the world has entertained almost ever since he walked the streets of Athens seemed to be leading me into quite an uncritical state of mind. All men regret to see their illusions attacked even when they know they are illusions, but I found myself quite unable to look upon the Platonic Socrates as a myth or upon Plato as having borrowed all he knew and all he contributed to the intellectual storehouse of the world from predecessors. We have known and loved the Platonic Socrates and he has occupied a pedestal scarcely if at all inferior to that of Confucius and Buddha and his figure in our world looms large to us, second only to that of Christ. From the point of view of prejudice alone I found myself revolting at the author's endeavor to drag our idol down to the commonalities of everyday life and taking up so much space in my notes to do so that when I sent off to some editors a pair of manuscripts, which they have reluctantly consented to publish, I found I had turned down my notes on the medicine of Plato which I had intended to incorporate as a sort of addendum to what I have said in a rather desultory way in the columns of this journal.

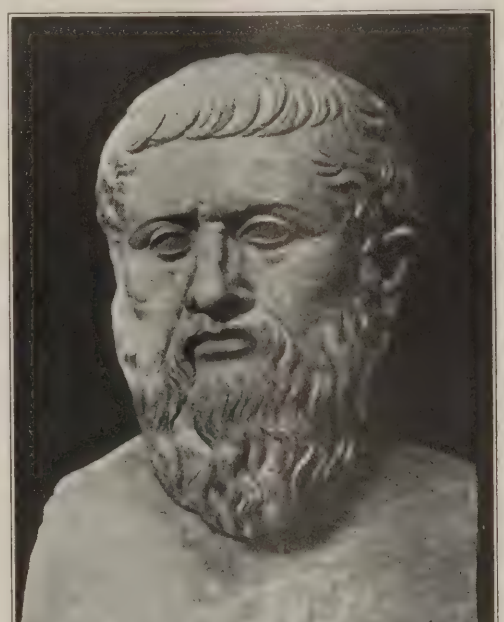
When, however, I look through the files of the Medical Journal and Record I fail to find what I was expecting—an essay of mine on Plato to which I had expected to make this a sort of sequel—and I am going to take up in this way what I have to say further in regard to the medicine of Plato at the point of some remarks I made on a certain theme in an essay on Herodotus last year (December 1923). To do so I break into the running discourse of the *Republic* which will carry us to the discussion as to the wisdom of lengthening life.

"Asclepius exhibited the power of his art only to persons who, being generally of healthy constitution and habits of life, had a definite ailment such as those he cured by purgations and operations and bade live as usual. In this he consulted the interests of the state. But bodies which disease had penetrated through and through he would not have attempted to cure . . . He did not want to lengthen out useless lives or to raise up puny offspring to an enfeebled sire. If a man was not able to live in the ordinary way he had no business to cure him. This was all in the interest of the state." (407) This is in line with the myth of Zeus punishing Asclepius and other medicating heroes for bringing man to life again. The doctors in the Iliad considered that sufficient which they did for Menelaus and Eurypylus and they did not think it worth while to tell them what they should eat or drink afterwards. Nestor's handmaiden, Hekamede, gave Machaon, a son of Asclepius himself, a mixed drink that was well calculated, we would now think, to lay low the stoutest digestion. The doctors who know what sickness is in their own bodies, those who have had the most diseases, "cure the body with the mind and the mind which is or has become sick can cure nothing." To avoid criticism I have followed Jowett's translation, partly literally and partly in faithful paraphrase, though I should have liked to put it a little differently. However, by going back (405) we may get the idea. These men of the golden age did not "fill themselves like pools with water and wind, compelling the descendants of Asclepius to give diseases the names of flatulence and catarrh. Is not this a disgrace?"

Socrates is a little off in his citation of Homer, at least the Homer we have, for it is Eurypylus who gets the highball with the kick in it, rather inflammatory, and yet the sons of Asclepius, who were at the Trojan war do not blame the damsel, who gives him a drink, or blame Patroclus, who is treating the case. . . . "Before the time of Herodicus the guild of Asclepius did not practise our present system of medicine, which habituates men to disease (I must alter Jowett's translation a little here). Herodicus, being an educator and himself of a sickly constitution, by a happy combination of training and doctoring found out a way of torturing first and chiefly himself and secondly the rest of the world . . . by the invention of a lingering death. He had a mortal disease . . . passed his entire life as a valetudinarian . . . He was in constant torment whenever he in any way departed from his usual regimen. By the help of science he struggled on to old age."

I have, in the essay on Herodotus, pointed out that our humanitarianism in abandoning the practice of leaving such people to their fate has loaded us and probably our posterity with a burden that may become excessive. We cannot afford to give up our humanitarianism. If we did that we would consider our civilization had perished. Having turned to eugenics as a part of it we are in a quandary how we can let the sick man live and breed. We are nonplussed, too, with the realization that there is very much less than half the truth in the complacent adage, *mens sana in corpore sano*. We know the sick body often harbors a sound mind, at least one often capable of immeasurable benefit to humanity. It was only a little while ago, a generation perhaps, many scientific men were following the demonstrations of Lombroso that genius is akin to insanity. It may be due to the inanity of their lives, but there is as much or more insanity among the children of

the rich than of the poor. If riches after which the best minds are said now to strive are the reward of brains—I do not doubt that, in the broad view, is so—this may strengthen the argument of Lombroso, and it may be erroneous to point to the vapid social life of the modern Croesus. However that may be, constant invalidism has frequently been the life companion of men who have wrought great things not alone in an intellectual and moral way, but in active pursuits. Not only have consumptives and epileptics been great litterateurs, but great soldiers, great philanthropists. The nonsense talked by too many eugenists is overpowering and disgusting. Castration for the poor and concubines for the rich paranoiac have excited but little remonstrance in the public and private discussions of the subject, but no reformer today, any more than Plato in his, can successfully push forward a propaganda so disingenuous. According to their principles Trudeau and Stevenson should have been smothered in their cradles. Napoleon and Cæsar should have been made eunuchs. There is nothing to be gained but the mistrust and misesteem of thinking men by blinking the difficulties of the breeding pen for man. It is singular how this talk of sappy sociologists has been the one optimistic trait which has survived the pessimism to follow an unprecedented slaughter of the healthiest men the civilized world could send to the greatest war that ever was. The world owes as much that is momentous, with exceptions like this, to sick men as to sound, it would seem to those versed in biography.



Tern of Plato in the Vatican.

This was foreign to the Greek way of thinking and Plato could carry out through his spokesman, Socrates, the discussion of a human breeding pen to suit his unrestrained fantasy, but it is much to be doubted if ever any sensible man, much less Plato, believed in its practicality. But if we are going to give free rein to our passionate longings for a better world I am not sure Plato's is not the best that has been painted for us, that is the one which does less violence to our analytical, critical sense. He insists as much on eugenics as the modern eugenist, but neither he nor his successors have solved the problem of the noble lady who loves the squire of low degree. Plato, however, living in an ancient pederastic world where you could do what you pleased with a woman, pen her up in an inner court if you wished, had some excuse of practicality for his sexual arrangements, but you can't pen up modern women with chicken wire. After 2,500 years of experience real eugenics for real men and women in this very real world is further away than ever. I am speaking of eugenics in the strict literal sense of the word without broadening the conception in order to find hiding places for sanity which is doing good work under an unfortunate name.

From the invincible persistence Nature exhibits in breeding as she thinks best one can not but wonder if her plan is not the best after all, but after all, too, what is Nature? The restraints of civilization are a natural product just as much as the child begotten by a genius or a king from a halfwitted family or a washerwoman. Human life as an artificiality in one sense extends far back into the mists of geological ages. Artificiality, the functioning of intellect, even at its start is a natural evolution, but artificiality once begun there is no turning back. Take away the club with which the cave man wooed and won his bride from family and friends, take away the gold with which the soap magnate woos his bride and her family, too, once take away these slightly varying ways of natural selection and the civilizer, the man who sets out to regulate civilization himself, becomes certainly artificial and unnatural if words mean anything, and they often do—anything at all. We have a right to exclaim what a mess the civilizer has made of it! Evolutionary anthropologists declare since the civilizer went to work there has been no progress in man's evolution as an animal, but I fancy this too is entangled in the uncertainty of the definition of words. We may well despair as did Socrates:

"O, dear me, cherished friend, how exceedingly we need rules of the highest excellence, if we are going to breed men, like hunting dogs and the falcons of the chase." He had warned his interlocutors as they approached this problem it was the severest test to which he should put them in helping him with his plan of a republic and we know he was speaking the truth. We are having so much trouble of other kinds with our own it seems hardly worth while to burden ourselves with that. In building an ideal republic only less trouble than in building a real one is experienced, and on the whole there is nothing in Plato's plan which is so demonstrably illusory as his kind of women in common. The ancients did not fully appreciate it but we know it from historical experience and our systematic study of the deepest roots of the psychology of men and women. Indeed in the real world no one has ever thought for a moment of the possibility of erecting a republic on the basis of a community of women, except some partially demented writers in the yellow press about Russia. Kings and aristocrats have been to some extent bred on the plan of Plato's artificial selection

but on the whole there is no time like the present so favorable for finding acquiescence in the conclusion that it has been a failure.

It is scarcely less difficult, for us in our very much more complex and advanced state of civilization it is very much more difficult, to provide by selection for the best in the state in the way of breeding. Even if we knew, it would be an impossible task. Apparently Plato thought he knew what was best and it is symptomatic of the other difficulties with which he must have contended to find he makes Socrates advocate a system of deception and secrecy in carrying out his scheme of making the best breed with the best. Genetics, if it has taught us nothing else, has taught us how uncertain is the result. The discards so vastly outweigh the selections for any special adaptability, indeed for any adaptability at all, to the complexity of our demands for the useful citizen, we may well echo and let the echo magnify a thousand fold the difficulties against which Socrates warned his companions in this matter. I need not allude to the details of the scheme by which he proposed to make headway against them. They are sufficiently well known even to those now very intelligent people who have indirectly what they know of Plato's republic only from the diffusion of the information which has emanated from his genius. The defenders of the state, that is the rulers, were to be chosen from the breeding pen, not by the ballot box. The discards from the breeding pens we can liken rather imperfectly to our defectives and degenerates. These it is said the Spartans destroyed. Plato hides them in places we may presume to liken to our hoped for rather than even now realized asylums, but in his day, before the advent of Christ, anything approaching to these he must have been embarrassed even to imagine.

We look in vain for the modern humanitarianism, which Christ brought into the world, in Socrates as he is drawn by Plato and Xenophon. Still it may be significant of its existence that Socrates does not recommend here the pitiless system attributed to the Spartans, whom Plato and Xenophon so admired. It seems preposterous that pity for human misfortune and suffering and an impulse to ameliorate their condition, quite aside from a regard for the state, should not have been always at least a dormant part of man's nature, buried deep in the inmost recesses of his soul perhaps, but existent at least and not necessarily allied to sentiments of self interest, as Spencerian philosophy insists. The sudden birth of this in the world in the teachings of Christ seems in the ancient world of stoicism something abnormal, so intimately associated with human nature on its emotional side does it seem to us. There was, however, a certain blindness to this side of it in these old fellows of ancient Greece and the stoics they engendered with which modern medicine and especially the modern state is unfamiliar. In the Republic the parturient mother should be allowed to nurse her own child only when there was no wet nurse or changeling to put in its place. It is true this does away at once with the question of illegitimacy and perhaps it solves some other problems, but there seems to us an evidence not of obtunded feelings of human sympathy so much as an obtuseness in an empire builder to a psychology which is fundamental in human nature. Plato looks on thirty years for men and twenty years for women as the most appropriate time for procreation, but he does not enter further into the sexual problem, which, with the decay of the efficiency of religious restraints, is becoming for us so vital a one. This blinking of the human element in Plato's Republic is perhaps its most glaring defect and it was, if tradition runs true, a defect in the man which made him not only absurd in his dealings with the Syracusan tyrants, but nearly made him a slave—a philosopher's ignorance of the heart of man.

So as I read this book of Dupréel's I am reminded that Plato had his limitations, that his generation like other generations stood on the shoulders of its predecessors, but we may also conclude that when men, however learned they may be, lose their historical perspectives they are very apt to start with false premises and come to wrong conclusions. Plato no more than any one else originated in himself. He fed on the wisdom of the nature philosophers. He had more than his share of that nutrition perhaps. We are aware that Plato must have portrayed Socrates after his own heart. We all do that with those who nestle most securely in our own. He doubtless laid in his mouth many things Socrates never said, ascribed to him many thoughts which never entered his head, but for all that, Plato added much that was his own to what he inherited and Socrates was a real figure and he was one to be venerated by after ages if only because he enlisted the love and reverence of a pupil like Plato. He was no myth. He was more than a legend.

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Medicine in Jugoslavia.—The last fifty years have seen remarkable progress in the teaching and practice of medicine in some of the associated countries included in the postwar state of Jugoslavia, says the *British Medical Journal* for January 24, 1925. After a long period of lethargy, due to social and political reasons, the national life of Croatia began to awake, and numerous literary and social societies were established between 1860 and 1870. In 1874 the Croat University at Zagreb was founded, and included among its more important scientific societies was the Medical Association of Croatia and Slavonia. For the last fifty years this association has been the centre of medical science in the country, and its activities have given birth to much hygienic legislation and progress in knowledge. The association was from the start the sole representative organization of medical practitioners in the two countries. Various congresses have been held dealing with a large variety of subjects, and in 1877 the official journal of the association, the *Lijecnicki Vjesnik,* appeared for the first time. One of the first aims of the association was the organization of a faculty of medicine at the Croat University of Zagreb—an ideal realized in 1917. In 1923 the association created a body to deal with the many and varied social interests of its members. The jubilee of the association occurred last year.

Contributors to the Science of Medicine

Wilhelm Konrad Röntgen

"Let him who will speak in admiration of the poetic imagination, which soars on spiritual wings in the world of fantasy, singing words that soothe the ear and weaving fancies that stir the emotions. The imagination of the scientist far transcends that of the poet, not only in the scope of its fancy, but surely in concrete accomplishment. . . . In the microcosm, the inspired imagination of Pasteur caused the isolation of a host of organisms, whose destructive and constructive functions are so greatly concerned in medicine. The imagination of Harvey lifted his eyes from the rutted paths over which legions of physicians since the time of Galen had traveled, to a newer vista where lay the truth of the physiological problem of the circulation of the blood So, too, the scientific imagination of Röntgen dared to dream of what was almost scientific heresy, invisible light." This tribute to the great discoverer of the x ray appeared at the time of his death in a biographical sketch by Dr. I. Seth Hirsch, of New York. And indeed the portraits of Röntgen, as well as the comments of his friends and pupils on his personal appearance, suggest that he had many of the personal characteristics which the world has come, rather erroneously, perhaps, to consider as typical of the artist rather than of the scientist. The most striking thing about his face was its revelation of an innate spirituality of nature that gave the warm, kindly glow to his dark eyes, as deep set as those of a musician, the charm of his smile, and the look of the mystic in his countenance when he was engaged upon some abstruse or difficult scientific problem. He was of unusual height, strongly built and robust yet slender, with very dark coloring and a full beard, and finely cut features indicating great refinement and keen intelligence.

WILLIAM KONRAD RÖNTGEN

To his friends and contemporaries, Röntgen was known as the most modest and unworldly of great men. He seemed in no way affected by the honors and acclamations that came to him through his discoveries—he was one of the very few "beginners" who received almost immediate recognition and acclaim—and he never reaped any material benefits from his work. "He gave it to mankind freely and wholly," to quote again from his biographer.

Wilhelm Konrad Röntgen was born on March 27, 1845, at Lennep in Eastern Prussia. His father wished him to follow in his footsteps, so sent him to a school of engineering in Holland to study th science of agriculture. Here he had his first scien tific training, going later to Zürich where he entere the polytechnic school. The famous physicist Clausius, was at that time teaching in the school, an it was doubtless in his classes that the young Rön gen heard first the principles of the dissipation o energy and the mechanical theory of heat produc tion. He was graduated from the university with degree of doctor of philosophy, and, what was eve more worth while, with a reputation for being fit i an unusual degree to do scientific work with ability accuracy and industry. Because of this he was mad assistant to Kundt, with whom he was associated i teaching for a number of years, and to whom he de clared he owed his best train ing in exactness of investiga tion. In 1870 Kundt wa summoned to Würzburg an Röntgen went with him, fol lowing him a few years late to Strassburg, where he wa made lecturer in physics After various other changes each a step higher in his pro fession of physicist, Röntge was finally called in 1888 t the directorship of the insti tute of physics in the univer sity of Würzburg, the secon most important university i Bavaria. It was here that th great discovery of the x ra was made.

Dr. Hirsch describes th discovery in a very tellin way:

"It is late in the fall o 1893. The ancient town o Würzburg is basking in th autumn sunlight in the vine clad valley of the Main. I the broad and tree line Pletcher-Ring is the Institute of Physics. Withi its walls, in a room littered with scientific appa atus, a man stands deep in thought before a glas bulb glowing with colored light. . . . Th little glass tube he studies so intently as it glow and flickers with its iridescent hues—what an amou of thought, of painstaking, laborious investigation represents! Pluecker, Gassiot, Geissler, Hittor Varley, Crookes, and Lenard, and before them a Faraday—how persistently the human spirit strive to find the meaning of Nature's mysteries! How crude the beginning, how halting the progress, ho hidden the goal! How slowly the foundations ar laid, often without definite plan; the walls risin haphazard, isolated, disconnected, until the maste mind sets the cupola, and lo! the structure glow with a beauty and significance undreamed of.

this vacuum tube, energized by the current of an induction coil, lie many of the mysteries and marvels, not only of modern electricity, but of matter itself—its ultimate constitution—the master problem of the universe. Geissler had passed the induced current through a tube of low vacuum and had produced the exquisite color effects. Hittorf had discovered the cathode ray therein. Crookes noted the change in the phenomena, as the vacuum was increased to about one millionth of an atmosphere. On Hertz's suggestion Lenard brought the cathode stream out of the tube, and studied it exhaustively. All this was in the mind of Wilhelm Konrad Röntgen, then professor of physics at the University of Würzburg, as he watched the flickering bulb. He noted the beautiful green fluorescence of the glass tube, just as Pluecker had done thirty-five years ago, and thought of Crookes's designation of 'radiant matter' as that influence which apparently radiated from the negative pole." The account is continued of how, called from the room, he laid the still glowing bulb on a book he had been reading that morning, and in which lay a large, flat antique key, which the great scientist was in the habit of using for a bookmark. It happened that just under the book lay a photographic plate holder, filled to use on an outing that afternoon. This plate was to give later the fateful exposure that has meant such countless things to science. When it was developed, the shadow of the great, antique key appeared on the negative. To a scientific mind like Röntgen's such a phenomenon demanded a scientific explanation, and he proceeded to analyze it. He first repeated the procedure that had led to the photograph, with identical results. Next he placed his hand over a covered photographic plate, energized the Crookes's tube above, and there was a photograph of the shadow of the bones. From these meagre but most significant beginnings, he carried on his researches until convinced that he had found a new form of radiation. Then, in 1895, he reported his results to the Würzburg Physicomedical Society, and in 1896 in a paper entitled A New Form of Radiation.

After this many honors were heaped upon him and many high positions offered him. The title of Excellence was bestowed upon him by the German government, and his statue was erected in Berlin. In 1901 he received the first Nobel prize for physics.

Like so many of the great-minded Germans of our times, the World War came as a calamity to his life, and in fact broke it. His grief was so deep that it affected his health, and his last illness and death were aggravated by the poverty and depressing conditions under which he had to live during the last few years of his life. He wrote to a friend at this time, "In deep grief our hearts ask what is to be the future of this people, and how will they ever reestablish themselves? It indeed requires the greatest courage and faith to walk unbowed in these days."

Death came to him on February 10, 1923, when, in spite of poor health, great poverty and depression of mind and spirit, he was still filling his place as professor of experimental physics in the University of Munich.

John Stearne, Founder of the Irish College of Physicians

The three hundredth anniversary of the birth of John Stearne (1629-1669) was celebrated by a reception on November 26th by the Royal College of Physicians of Ireland says the *British Medical Journal* for January 24, 1925. A scholarly address of great literary distinction, dealing with their pious founder's life and activities was delivered by the registrar, Dr. Percy C. Kirkpatrick, whose numerous essays on the same lines mark him as the author to provide us with a complete history of the Irish College of Physicians.

Stearne entered Trinity College at the tender age of fourteen and one half years, and became a scholar in 1641; but the times became so troublous that the Provost sought refuge in England, and among others Stearne followed his example; in 1642 he entered Sidney Sussex College, Cambridge, where he almost immediately took the B.A. degree, proceeding to the M.A. in 1646; in the intervening four years, the happiest part of his life, he probably read deeply in classics, the philosophical works of the ancient fathers of the Church, and medicine. Francis Glisson was regius professor of physics (1637-1677); Wharton of Pembroke and the *Adenographia* and George Ent of his own college were then associated with the university. About 1649 the times again obliged him to move, and on this occasion he went to Oxford, where he turned in his distress first to stoic philosophy and then to peace in Bedfordshire. But in 1651 he was admitted a Fellow of Trinity College, Dublin, becoming a Senior Fellow in the next year and professor of Hebrew in 1656; as he was also professor of medicine and perhaps lectured on law, he is a typical example of the all round excellence of a Fellow of Trinity. His seventeen years of residence were extremely busy and saw much productive work; he wrote six books in Latin, all on philosophicotheological subjects and not dealing primarily with medicine; his erudition was great, but originality—in those days a dangerous property—was not obvious in his writings.

As a medical practitioner, Stearne was a follower of Hippocrates rather than of Galen, being an ardent supporter of physical therapeutics, and an enthusiastic advocate of the use of cold water, tobacco (chiefly by chewing), opium, and the smell of freshly dug earth, which, Dr. Kirkpatrick slyly adds, may also "explain the benefit which some golfers believe that they obtain from the pursuit of the game." In 1661 Stearne set about founding the College of Physicians, obtaining a Royal Charter from Charles II in 1667, and was nominated president for life.

Editorial Articles

MILLIONAIRES AND MEDICINE

Whatever may be the feelings of American millionaires, and many are ascribed to them, a lack of generosity to science and medical science cannot be laid to their charge. Indeed, in the cause of education of every description they have poured out money like water. Unlike the very rich men of other countries, or rather in a greater degree than the rich men of other countries, they have had the shrewdness to perceive that money spent in the interests of medical science will be returned manifold. Their reasoning is eminently logical. If a country is not healthy and well educated it cannot be prosperous and must quickly decline; and in a poor country what opportunity is there to amass fortunes?

Health comes before all. Sickly or ill nurtured persons, however well educated, cannot compete successfully with healthy and vigorous well educated persons. Therefore, first make the individual members of a nation healthy and then equip them at all points, according to their several bents, for the battle of life. The rich men of this country have recognized that it is to their own advantage that their fellow citizens shall be healthy and thoroughly educated, and have expended money without stint in order that this aim as far as humanly possible shall become a fact. It may be said with truth that the dollars of the multimillionaires are leading the attack against two of the traditional and most to be dreaded enemies of the human race, ignorance and disease, which go hand in hand. In the battle against disease stupendous sums have been and are being spent. A short time ago James B. Duke of tobacco fame gave forty million dollars to found a college and to aid charities, especially hospitals.

Of course, the Rockefellers have contributed most largely to medical science and to the discovery of means for preventing disease. For example, the Rockefeller Institute and various other foundations have given millions for the furthering of medical research and the elevation of medical standards in all parts of the world. Remarkable results have been obtained already and the work of the scientists of worldwide renown connected with the foundation are really public, almost international, property, and in their field have done immeasurable good. Many other millionaires have made hospitals and research institutions their chief means to aid the public in the fight against disease, and the money totals given run into the hundreds of millions. Moreover, these amounts are not spent but merely the income from them and thus the total will continue to increase. Millionaires and medicine in this country are linked together in the campaign against disease for the good of humanity, the nation and the individual.

NUTRITION AND THE TEETH

Any one who has had occasion to observe the teeth of animals must have been struck with the fact that they are not decayed. A dog may get so old that his teeth are worn down, and he may have broken some of them off, but a dog with dental caries is rare indeed.

Paleontologists have long recognized the fact that primitive man did not have defective teeth. Even the Nebraska tooth, from which the Hesperopitecus has been reconstructed, showed no cavity formation and in the hundreds of precolumbian skulls in the National Museum at Washington there is scarcely one which shows any evidence of dental decay. It is a sad commentary on our civilization that from fifty to seventy-five per cent. of the school children in the United States have defective teeth and that this condition is the result of our civilization is shown by the fact that primitive man, who ate a relatively well balanced ration, had no such defects. Mound builders' skulls frequently show the teeth ground down more than half on account of the diet of parched corn which they ate, while modern skulls, taken from a burial place only a few hundred feet away, show evidences of extensive decay and little wear. The one wore his teeth out; the other rots them out.

The large amount of tubers and cereals which we have introduced into our diet and above all, the terrific quantity of sugar which we consume, are reducing man to a creature with a poor masticatory apparatus.

There is a more serious phase of the question than this. This incomplete, lopsided diet is producing skeletal defects and is reducing the physical stamina of the race. We are eating degerminated cereals when we should be eating meats, and we are consuming canned vegetables which have had some of their vitamines killed when we should be eating fresh green vegetables. A considerable portion of the race is therefore suffering from an avitaminosis. When the results of a badly balanced diet produce rickets, or scurvy, or beriberi, or pellagra, the condition is easily recognized and given appropriate treatment, but there are hundreds of

cases of subnormal health which are due to a lack of the vitamines in the diet which do not receive the appropriate dietary regimen.

Practising physicians should pay more attention to what their patients are eating and they should endeavor to indocrinate them to the end that they will eat more of the proteins and less of the foods which are lacking in vital elements. Above all, they should teach the danger of the excessive use of sweets and sweet foods and they should see to it that the person of sedentary occupation does not consume a dietary which would be suitable for a farm laborer. Here is a thing on which the integrity of the race depends and man must cease to starve his body in this way, or a rapid and continuous degeneration of the racial stock will surely follow.

THE PREVENTION OF HEART DISEASE

Many, perhaps most, of our diseases, are diseases of civilization. Of all the diseases which have progressed *pari passu* with civilization heart disease, on the whole, is the most prominent, inflicting the largest amount of disability, and taking the greatest toll of human life. In Great Britain heart disease heads the list as the cause of death and in this country its advance has been so alarming that a strenuous campaign has been instituted against it throughout the land.

Eight cardiac associations have been formed and cardiac clinics have been organized in fourteen States or twenty-three cities in this country and two in Canada. In addition, in May, 1922, at a meeting held in St. Louis, called together at the invitation of the Association for the Prevention and Relief of Heart Disease of New York City, it was decided to form a national committee. A meeting of this committee was held at Atlantic City May 1, 1923, when it was resolved to incorporate the American Association for the Control of Heart Disease, to be based at the outset on the local cardiac organizations of the various cities.

It will thus be observed that the danger of existing conditions is realized by the medical profession here and that steps are being taken to control the advance of heart disease. Dr. B. L. Russell has contributed a series of articles to the *Boston Medical and Surgical Journal* on the medicosocial aspects of heart disease. In the concluding article in that journal of October 9th, it is pointed out that the prevention of heart disease is by far the most important measure to be considered in putting forward an effective program for the campaign against cardiac disease.

Attention is drawn to the fact, that the early recognition of rheumatic, syphilitic and thyroid conditions are essential steps in eradicating heart disease, but one of the most important measures is the eventual prevention of such diseases as rheumatic fever, chorea, and syphilis themselves.

In a valuable report on the incidence of rheumatic diseases in England and Wales compiled by insurance practitioners in various parts of that country and revised by specialists attached to the British Ministry of Health, and published by the Ministry in the early part of last year, the relationship between heart disease and rheumatic affections is traced and commented on. It is stated that nearly half the patients treated for acute rheumatism showed signs of recent or old endocarditis. It must also be taken into account that chronic heart disease is probably largely rheumatic in origin. Thus, it seems that in England and Wales rheumatic affections are responsible for a large proportion of the heart disease and in this country conditions are more or less similar. Of course, too, syphilis is a cause of a considerable amount of heart disease, and so are thyroid conditions to a lesser extent.

Therefore when Dr. Russell says that the most rational and certain means of exterminating or of greatly limiting the occurrence of heart disease is by preventing rheumatic fever, syphilis and thyroid conditions, an obviously sane and reasonable statement is made.

In many laboratories, and notably in those of the Rockefeller Foundation, efforts are being made to discover the organism which causes rheumatic fever. Dr. Russell points out that better coordination of the medical departments in industrial plants with services available through family physicians and hospital clinics, would greatly aid in the recognition and treatment of early syphilis and abnormal thyroid conditions.

The situation, stated briefly, appears to be that rheumatic affections, syphilis, and abnormal thyroid conditions are mainly responsible for the menace of heart disease and that the only really effective way of grappling successfully with the problem is to prevent these diseases and conditions as far as is possible. Among the many ways in which rheumatism may be prevented is the insurance, as far as may be, of a sufficient supply of good houses and, as far as can be done, an adequate provision of suitable food. Care of the teeth and tonsils is another mode of prevention.

Dr. Russell says a closer cooperation must be sought with industry, that is, in order to prevent heart disease and heart failure more frequent medical examinations must be made and closer medical supervision instituted. Educational propaganda is indicated to teach the masses and the young that heart disease may be largely prevented and con-

trolled by preventing diseases which by poisoning and devitalizing the system provide a fruitful soil for the germination and development of the seeds of infection.

THE COMPLICATIONS OF SYPHILITIC PANCARDITIS

There are three lesions in syphilitic pancarditis which, in reality, are true complications of the specific gummatous, sclerous or vascular changes. These are aneurysm of the heart, infarct, and rupture of the heart.

Portal, in the eighteenth century, had already pointed out that the virus of syphilis might produce erosion of the heart, with consequent weakening of its walls. Later on, Kockel related the case of a man with long standing lues who died in asystolia. At autopsy a sclerous myocarditis was found with a partial aneurysm, the size of a pea, at the apex of the ventricle. There was also a fluid collection in the pericardium which was partially adherent. There were sclerogummatous lesions in the myocardium, while the endocardium was thickened and fibrous.

The cases recently reported by Pick and Bouisson, Caussade and Joltrain may be mentioned. It can readily be conceived how, following the elimination of a completely softened gumma, the cardiac muscle may be so thinned as a result, that it allows itself to be forced and partially dilated. Whether there is a large infarct or a cicatricial sclerosis there is always partial destruction of the walls which may result in aneurysm.

Infarct of the myocardium occurs especially after a specific involvement of a branch of the coronary. A complete occlusion of the arteriole ensues and, as a consequence a local apoplexy—a zone of congestion —which will characterize the infarct. Salles has recently recorded a detailed description of a case in his thesis (Paris, 1918), and some years ago Ehrlich also reported an instance.

Although an aneurysm may not have necessarily resulted from mere thinness of the cardiac walls determined by miliary gummata or foci of sclerosis, rupture of the heart may ensue spontaneously. Turner has reported rupture of the aorta into the pericardium and a similar case has been recorded by Nitot. Kroenig found in an old syphilitic a voluminous hemopericardium and atrophy of the fibroid wall of the ventricle to the extent of two millimetres thickness, presenting a parietal thrombus. The case reported by Deguy and Ménard was that of a man of twenty, who suddenly died. A subepicardiac infarct was found with rupture of the left ventricle.

The treponema leaves traces in the heart walls in the form of disseminated lesions. Those of the interauriculoventricular septum, involving the bundle of His, give rise to the Stokes-Adams syndrome. The muscular fibres composing this bundle may be the seat of gummata, diffuse embryonal lesions or a more or less circumscribed fibrous myocarditis. At least this is Vaquez's opinion. To this pathology, Bricout adds the possibility of extension of a chronic syphilitic aortitis to the bundle of His. Quite a few instances of gummata of the septum have been recorded by Rendu, Breitmann, Stockmann, Hanford, Chapman, Robinson, Stork and Handwerk. Vaquez and Esmein have described the sclerogummatous changes of the bundle of His, which is infiltrated with minute patches of sclerosis. Similar cases have been observed by Ashton, Norris and Levenson.

Finally, the bundle of His may undergo purely fibrous changes. The lesion is manifest, but its syphilitic origin, although suspected, cannot be absolutely demonstrated.

ON PHARMACOLOGICAL HEART CONTROL

There are certain drugs which have been shown to have a definite action in controlling the heart and as such are used with effect in suitable cases. Opinions as to the value of some of these drugs differ and even in the case of the most widely used and greatly lauded heart drug of all, digitalis, views are by no means unanimous and by some digitalis is regarded as not wholly worthy of the praise which has been so long and so heartily lavished upon it.

In an especially able paper by one of the first British authorities which Dr. Alexander Blackhall-Morison read before the North London Medico-Chirurgical Society on December 20th last and published in the *Medical Press and Circular,* March 5, 1924, the subject of heart control is dealt with. That part of the paper which discusses the pharmacological treatment of lost heart control is well worthy of a close study. The author rightly says that pharmacologically we have to sit at the feet of Nature, and some of the most potent instruments of pharmacological heart control have been empirically discovered by the laity, before they were scientifically studied and recognized by the profession. It is pointed out that the drugs used to obtain and promote control when it is lost, in the case of the heart, fall into three groups, like the elements of the triple unit, namely:

1. The digitalis group. 2. The atropine group among which may be classed those agents which relieve pain, induce sleep, and affect the vasomotor system, such as neural hypnotics and the nitrites. That supremely valuable agent opium belongs, however, most reasonably to the digi-

lis group. 3. The hematinic group. In other ords, the pharmacological agents which enble us to control the disordered heart are those hich retard its action, those which accelerate or ugment it and those which promote the nutrition f the organ. Digitalis the "opium of the heart," as has been called, belladonna, the rouser, the ccelerator, augmenter of the heart, and the poppy, ne soother of the nervous system, are types of the eneficial agents without which the cardiologist ould exercise little control of the heart.

Blackhall-Morison compares the effects of digilis and quinidine in auricular fibrillation and oints out that it is a peculiar but undeniable fact iat cases of irregular action which have resisted ie effects of digitalis for years, become quite regur in some cases, under quinidine in a few days. Moreover, that when such cases relapse, they again romptly take on a regular action on the resumption f quinidine. The explanation given is that probbly the rationale of the action of digitalis and uinidine is not the same.

There is good evidence that digitalis acts as an hibitant of cardiac action through the vagus, while uinidine is believed to act directly on cardiac uscle. Blackhall-Morison has never observed reardation with rhythmical extrasystole after the se of quinidine, as is often seen after digitalis. Of ie value of mercury as an adjuvant in the pharmalogical control of the heart, clinical experience aves no doubt. The writer thinks that it may aid ie action of digitalis and squill by intestinal disinction, although the clinical result best established a reduction of blood pressure in arteriosclerolc cases, and the promotion thus at times of profuse iuresis and easier heart action. To the value of ie endocrines in cardiotherapy Blackhall-Morison fers with caution but praises both camphor and rychnine as effective heart stimulants. In most ises of heart disease or of loss of heart control or defective heart control drugs are valuable, indeed sential. There are those who will hold that drugs e of little avail and that the main reliance in the ajority of cases of heart affections should be aced on rest and diet, on posture and exercise id so on.

But clinical experience goes to show that drugs ed judiciously and as adjuvants are of great use treatment, in certain cases essential to success. rug nihilism is not so prevalent as a few years ago. t one time, perhaps, the value of drugs was exgerated, and fads with regard to an especial drug nded to become established to the detriment of l concerned. Now common sense views with reird to drug therapy are the rule, and as Blackhallorison shows, clinical experience even if not altogether always in keeping with modern views must carry weight. A good deal of old fashioned drug therapy if empirical was based on some clinical experience and is returning into vogue, together with views as to etiology which were supposed to be dead.

THE CHILD GUIDANCE CLINIC FOR THE PROBLEM CHILD

"A child guidance clinic is an organization that seeks to bring to the study, training and treatment of problem children whatever medicine, psychiatry, psychology, education and social case work offer. These contributions from specialists in different fields are combined in a well rounded, coordinated unit, known as a child guidance clinic, that seeks to deal, not only with the child, but with situations in his environment that have contributed to make him what he is. In a child guidance clinic, no part of the study—physical, psychiatric, psychological, educational, or social—is separate and distinct unto itself. Each goes to make up a total and complete picture of the individual child and his adjustments to life. They each contribute to a properly rounded program of rehabilitation and treatment." Thus Dr. V. V. Anderson, director of the Division for the Prevention of Delinquency of the National Committee for Mental Hygiene, defines and describes the function of the child guidance clinic in an article in the October, 1924, number of the *Nation's Health*. Dr. Anderson develops his subject in a practical and satisfying manner by asking pertinent questions, then giving brief but adequate answers to them. These questions include discussion of the personnel of such a clinic, its cost, how it should be financed, the type of child that should receive the services of such a clinic, what is a social examination, why is a physical examination made, what is a psychological and what a psychiatric examination, how does the clinic make use of this information for the benefit of the child and those responsible for his guidance, is the cooperation of various local agencies important in treatment, how can a community be made acquainted with the significance of such a movement and the existence of such an enterprise, and how can a city secure aid in developing a child guidance clinic along the most modern and approved lines. Important as are all these questions, perhaps the last is the one which communities know least how to answer or even get information about. Dr. Anderson goes on to tell us that a special division within the National Committee for Mental Hygiene has been created for the purpose of administering that phase of the Commonwealth Fund's program, which is concerned with psychiatric, or child guidance, clinics. This division, un-

der Dr. Anderson's direction, maintains for cities interested in the development of psychiatric and child guidance clinics two types of clinical service: demonstration clinics, and consulting field service.

The Demonstration Clinic Service maintains two large clinics, staffed by psychiatrists, psychologists, psychiatric social workers, and statistical and clerical forces. These clinics remain approximately one year in a community, then move to another demonstration centre, and are available only to the largest cities where the best social facilities may be utilized in conducting a model demonstration. "The object is to plant only a few demonstration centres in the country—hoping to develop in these centres a type of work that will stand out as an object lesson to other cities." One of the conditions of obtaining the services of these clinics is that the period of demonstration in the city shall be followed by a permanent clinic locally financed. Such clinics must be adequately maintained, with a minimum annual budget of at least twenty-five thousand dollars. Properly trained personnel must be secured and close relationship with various local agencies maintained. "It is expected that the director of the permanent clinic shall have some relationship to the teaching faculty of the university in cities chosen."

These demonstration clinics not only demonstrate the methods employed in the adjustment of problem children, but also concern themselves with organizing the facilities of the community for working properly in cooperation with the permanent clinic. The demonstration staff works with the division's central office in the choice and training of personnel for the permanent clinic.

The Consulting Field Service, the second type of clinical service rendered, is available to cities, large and small, that are not able to receive the larger demonstrations, yet wish to develop their own clinics and to have assistance and advice as to organization and operation. The consulting field staff remains usually three or four months in a city, helping in assembling the personnel, getting under way the work of the clinic, perfecting its organization, establishing its relationship to the community, laying down sound clinical and social case methods, and "carefully nurturing along the most approved lines the undertaking until it has achieved a safe development." No city is eligible for receiving such service which is not already prepared to finance some sort of clinical work and is seeking aid in establishing it. A minimum budget of fifteen thousand dollars is considered necessary for child guidance clinics in smaller cities.

Dr. Anderson believes that a community can best be made acquainted with the significance of such a movement and the existence of such an enterprise through the appointment of a child guidance advisory committee in each city. This committee should be made up of influential persons from the various official and public agencies of the community, and should make a study of the need for such a clinic and develop a program in which all the social facilities of the city play a part. This committee "should carry on a constant stream of education before various clubs and organizations. When the child guidance clinic has been established, this committee should become the advisory and administrative group in charge of the enterprise. It should through its continuing study of the needs of the clinic and the community, seek to develop the work along the soundest and safest lines."

News Items.

Army Medical School.—Graduation exercises of the Army Medical School, the Army Veterinary School, and the Army Dental School were held February 10th, in Washington.

Memorial Meeting.—A memorial meeting for the late Dr. Walter E. Fernald, first president of the Massachusetts Psychiatric Society, was recently held at the Boston Psychopathic Hospital.

Nome Diphtheria Epidemic.—Reports from Nome that the diphtheria epidemic is under control and no further antitoxin needed at present, have resulted in the cancellation of the flight of the navy plane.

Memorial to Dr. Dyer.—A bronze portrait panel of the late Dr. Isadore Dyer, for many years dean of the medical school of Tulane University of Louisiana, has been erected by the faculty, and recently dedicated. The address was made by Dr. Rudolph Matas.

Georgetown Research Laboratory.—A research laboratory, to be known as the Institute of Chemical-Medical Research, is to be established at Georgetown University, Washington, D. C., supported by an initial endowment of five million dollars, to be in hand by next December.

Psychiatry Fellowships.—Fellowships for training in psychiatry have been granted to Dr. Paul J. Ewerhardt, formerly of the Kankakee and Chicago State Hospitals, and to Dr. Philip J. Trentzsch, formerly of St. Elizabeth's Hospital, Washington. Study for the present will be done at the Boston Psychopathic Hospital.

Memorial to Dr. Andrew J. McCosh.—Among the gifts to the new Medical Centre is a donation of $100,000, by friends of the late Dr. Andrew J. McCosh, for an operating amphitheatre. An additional $93,000 will be used to establish a memorial fund to further medical and surgical knowledge, under direction of the board of managers of the Presbyterian Hospital.

Physicians in Industry.—The forty-sixth meeting of the Conference Board of Physicians in Industry was recently held in New York. Discussion was devoted to the care of trifling injuries, for the avoidance of infection, and treatment of more serious cases drawing compensation benefits, with the return of the worker to some sort of employment under supervision, as soon as possible.

Contest Winners.—The essay contest on "Interrelationships of Hospital and Community," held by the *Modern Hospital*, resulted in the awarding of the first prize of $350 to Mr. Edward A. Fitzpatrick, dean of the graduate college and educational director of the hospital college of Marquette University, Milwaukee; the second prize of $150 to Dr. Lucius R. Wilson, assistant superintendent of Barnes Hospital, St. Louis; and the third prize of $100 to Dr. D. L. Richardson, superintendent of City Hospital, Providence.

St. Louis Medical Society.—The St. Louis Medical Society is beginning its new building, the library portion being constructed first. An expenditure of about $300,000 is contemplated.

Supervision of Baby Shows.—A resolution of the council of the Illinois State Medical Society suggests that all baby shows or baby conferences held in the state should be under the general supervision of the state society, and the direct supervision of the county society.

New Germicide.—A new antiseptic, named hexylresorcinol, to be taken internally for disinfection of the kidneys and urinary tract, has been developed at Johns Hopkins University, by Dr. Veader Leonard, chairman of the clinical committee on internal antisepsis of the National Research Council. The council has appointed a committee of fifteen to work with him in further researches to determine the extent of the application of the chemical.

Postgraduate Study.—The seventh annual postgraduate course in infectious diseases and public health, offered through Albany Medical College and the New York State Department of Health, will begin March 5th. The fee is twenty-five dollars, and the courses will be of interest both to practicing physicians and to health officers. Communications should be addressed to the director, Dr. Charles C. Duryee, State Department of Health, Albany, New York.

National Board Certificates.—The State Boards of Medical Examiners of Michigan, Oklahoma, and Wyoming have recently passed resolutions authorizing the acceptance of the certificate of the National Board of Medical Examiners for medical licensure. Michigan reserves the privilege of reviewing the full credentials of each candidate, and in Wyoming, an oral examination will be given. There are now thirty-one States accepting the National Board's credentials.

Gifts and Bequests.—Among the public bequests in the will of the late Emily Howland Bourne was included $10,000 to the New York Eye and Ear Infirmary, and $20,000 to the New York Association for the Blind.

The will of the late Mrs. Kate S. Richardson provides $200,000 for the New York Hospital, $100,000 for the United Hospital Fund, $200,000 for the Henry Street Settlement, and $60,000 for the Association for the Aid of Crippled Children.

Chiropractic Licensing.—A bill introduced before the New York Legislature requires that chiropractors have sufficient knowledge of studies generally pursued by medical students to enable them to diagnose disease. The bill also provides that one chiropractor shall be a member of the board examining and licensing all practitioners; that chiropractors in practice ten years can be recognized without prior examination, and these would have to have graduated from a two years' course of four months each.

Friends of Medical Progress.—The society known as Friends of Medical Progress, with headquarters in Boston, has moved to New York, 370 Seventh Avenue, where there will be more opportunity for cooperation with other health organizations. The name has been changed to American Association for Medical Progress, and Mr. Benjamin C. Gruenberg will be in active management. The purpose of the organization is the dissemination of medical knowledge among the general public.

Dental Hygiene Lecturers for Medical Societies.—The Oral Hygiene Committee of the State Dental Society offers cooperation with the Division of Maternity, Infancy and Child Hygiene in providing dentists to lecture before medical societies on the care of the teeth of the preschool child and the expectant mother. Requests for this service may be sent to the Division of Maternity, Infancy and Child Hygiene, or to Dr. Lincoln A. Timerman, 39 Market Street, Amsterdam, N. Y., chairman of the above mentioned committee.

Postgraduate Tour and Clinic.—A foreign tour, lasting from May 18th to July 6th, has been arranged by the Interstate Postgraduate Assembly of America. Clinics will be held in Toronto and Montreal, and also in London, Liverpool, Manchester, Leeds, Dublin, Belfast, Glasgow, Edinburg, Newcastle, Paris, Lyon, and Strasbourg. Extension tours may also be arranged for other cities. The tour is open to members of the profession in good standing in their state or provincial societies, and to their families. Correspondence should be addressed to Dr. William B. Peck, Managing Director, Freeport, Illinois.

Personal.—Dr. William Allen Pusey, president of the American Medical Association, and a charter member of the Chicago Dermatological Society, was the guest of honor at its twenty-fifth anniversary meeting.

Dr. Irvine McQuarrie has become chief of the newly organized pediatric service of the Henry Ford Hospital, Detroit, resigning from his position at Yale University.

Dr. Archibald S. Dean, who has served as psychiatrist on the staff of the National Committee for Mental Hygiene, has been appointed pediatrist in the Division of Maternity, Infancy, and Child Hygiene of the New York State Department of Health.

Dr. Ralph P. Truitt, formerly medical director of the Illinois Society of Mental Hygiene, and also director of the National Committee for Mental Hygiene's child guidance clinic in Los Angeles, has been appointed director of the division on the prevention of delinquency of the committee.

Dr. Curran Pope, neurologist, of Louisville, Kentucky, has been appointed to the State Board of Charities and Corrections.

Hospital News.—Unity Hospital of New York has opened its newly equipped clinic and outpatient departments. Free insulin and radium can be provided for needy cases.

The Brooklyn Jewish Hospital is planning the construction of a new wing, to cost $600,000.

On September 1st the municipal hospital at Montebello, Baltimore, will open six buildings, forming the nucleus of the Baltimore General Hospital. The amount expended has been about $900,000. Dr. Birkhead MacGowan will be superintendent. Treatment will be free to residents of Baltimore.

Ten social workers have been added to the staff of the St. Louis city hospitals, by a recent authorization of the board of aldermen.

The Woman's Homeopathic Hospital of Philadelphia is starting a new building, to be known as the Emma Shaperkotter Maternity Wing, which will cost about $250,000.

An eight-story brick building, to cost $110,000, is planned for the Bekur Cholim Hospitar, Lafayette and Summer avenues, Brooklyn.

The Polyclinic Hospital of Harrisburg, Pennsylvania, will soon begin work on a $300,000 building.

Seven lots on East Ninety-eighth Street, New York, have been contributed to Mount Sinai Hospital by its trustees, to provide space for a maternity hospital, psychiatric clinic, and school of nursing.

Society News.—The Bronx Dermatological Society, of New York, has recently been founded, for the clinical study of dermatology, with Dr. Adolph Rostenberg, president, and Dr. M. Breakstone, secretary.

Tentative plans have been made for the fifteenth annual meeting of the American Psychopathological Association, to be held in Washington, May 7th or 8th.

The ninth annual clinical session of the American Congress on Internal Medicine will be held in Washington, March 9th to 14th. Practitioners and laboratory workers interested in the progress of scientific, clinical, and research medicine are invited to take advantage of the sessions; inquiries should be addressed to the secretary-general, Dr. Frank Smithes, 1002 North Dearborn Street, Chicago, Illinois.

At the meeting of the Washington Heights Medical Society, January 13th, at the parish house of the Chapel of the Intercession, installation of the following officers took place: President, Dr. W. H. Boese; first vice-president, Dr. L. L. Fulkerson; second vice-president, Dr. Gove S. Harrington; treasurer, Dr. Winifred Perkins; secretary, Dr. William A. Fraser; membership committee, Dr. Frederick E. Bauer, Dr. W. W. Bostwick, Dr. Harold W. Brown; literary committee, Dr. Robert H. Rose, Dr. Franklyn Welker, Dr. Alexander Nicoll.

The New York Physicians' Mutual Aid Association held its fifty-sixth annual meeting on Tuesday, January 27, 1925, at the New York Academy of Medicine, in which building the Association has had its office for many years. The membership now stands at about 2,300, distributed throughout and confined to the State of New York. The management of the organization is in the hands of a board of trustees, all of whom are physicians and who serve without remuneration. Among the officers elected for 1925 are Dr. Ward B. Hoag, president; Dr. A. Edward Davis, secretary; Dr. Howard Gillepsie Myers, treasurer.

Foreign Correspondence.

LONDON LETTER

(From our own correspondent)

London, *January 3, 1925.*

SMOKE AND HEALTH

The serious effects on public health of the pollution of the atmosphere by smoke, and the special culpability of the domestic open fire, were the subjects for comment in the annual report of Dr. R. King Brown, Medical Officer of Health for Bermondsey, London. He asserted that smoke pollution was one of the most urgent problems of public health, and with the growth of urban areas it became increasingly important. That respiratory diseases, including pulmonary tuberculosis, were greatly aggravated by the condition of the atmosphere was universally admitted. He pointed out that here in London the death rate from these diseases mounted up during and immediately after a fog, so that there could be no question of a connection between the two. The problem was very complicated, especially as three fourths of the smoke was caused by domestic chimneys, and more than three fourths of the damage. In the case of industrial smoke, the combustion being done in high temperature furnaces, was more complete and there was an absence of tar and acid products, whereas in domestic smoke, caused by the combustion of ordinary coal at a low temperature, there was a very large proportion of tar and acids, which were the chief causes of the damage, not only to the buildings but to people's lungs. It was thus evident that the stopping of industrial smoke, though it would help matters considerably, did not by any means solve the problem of the pollution of the atmosphere, since it left the domestic problem untouched. As a matter of fact the problem was mainly an economic one. Until a cheap smokeless fuel equal in efficiency and price to ordinary coal, was placed on the market, there seemed little chance of doing away completely with the domestic coal fire. Of late years there had been a great increase in the use of gas and electricity in London, and the improvement produced thereby was noticeable in the diminution of the severe fogs which used to occur regularly about November some twenty-five years ago. There was no doubt that this pointed the way to reform in the matter of domestic smoke, and every endeavor should be made to encourage the use of gas and electricity for cooking and heating, and at the same time to discourage the use of raw coal for the same purposes. British people seemed to be wedded to the ordinary open fire, and until a plentiful supply of cheap smokeless fuel was discovered Dr. Brown did not think that there was any chance of clearing the atmosphere.

LONDON HOSPITALS

The Prince of Wales presided recently at a meeting of the General Council of King Edward's Hospital Fund for London, held in St. James Palace, when grants aggregating £235,000 were awarded to the various London hospitals and to convalescent homes, not attached to these institutions. In addition, distributions amounting to £81,000 were authorized out of the legacies of the late Mr. and Mrs. Wells in aid of extensions and improvements, making a total for the year of £316,000. In his speech the chairman described the improvement in the finances of the hospitals as "almost miraculous." It meant, he said, that the people of England were really attached to the voluntary hospitals and were ready to make the necessary sacrifices to maintain them. He announced that it had been decided to extend the area of the fund's operations from a radius of nine miles round Charing Cross to a radius of eleven miles round St. Paul's, thus bringing in more of the eastern districts.

On December 17th last Mr. Neville Chamberlain, Minister of Health, was the principal speaker of the Mansion House, London, at a largely attended meeting of the constituents of the Metropolitan Hospital Sunday Fund. Mr. Chamberlain said in part, that in spite of the wonderful generosity of the public, the voluntary hospitals were still struggling against circumstances which were almost too much for them in trying to maintain their services at the level at which they desired to see them. The expenses of administration had increased enormously. If the hospitals were to maintain themselves up to date; if they were to take advantage of recent developments, and be able to give to those who attended them the very latest types of treatment, with the very best equipment, then it would inevitably mean that the cost of a bed must continue to rise, and the demands on the public become greater and greater. If the voluntary system were to break down, if some day in the future voluntary hospitals had to be taken over by local authorities or by the State, he imagined that their disappearance as they stood today would leave a gap in the social system which they would find difficult if not impossible to fill. Mr. Chamberlain said that he was not going to indicate any policy on the part of the Government in regard to the future of the voluntary hospitals, but he hoped if he were granted time enough, before he gave up his present office, that he might be able to do something to put this matter on some satisfactory and permanent footing.

NEW YEAR HONORS FOR MEDICAL AND SCIENTIFIC MEN

Knighthoods have been conferred on Dr. John Campbell, senior surgeon to the Samaritan Hospital, Belfast; Dr. T. Morison Legge, medical inspector of factories; Mr. Holburt J. Waring, formerly vice-president of the Royal College of Surgeons of England and Vice-Chancellor of the University of London; and Professor Gowland Hopkins, professor of biochemistry in the University of Cambridge; Dr. Henry J. F. Simpson, obstetrical surgeon, West London Hospital, has been given the R. C. V. O.

ENCEPHALITIS LETHARGICA IN LONDON SCHOOLS

The provision of separate schools for children who have suffered from encephalitis lethargica is said to be matter for consideration by the London County Council. It is stated that children who have had the disease often undergo an entire change of character. Not only is there physical deterioration, but they lose control over their emotions.

LATIN AMERICA NEWS LETTER

(From our own correspondent)

Balboa Heights, C. Z., *January 10, 1925.*

EFFICACY OF YELLOW FEVER VACCINE

Dr. Hideyo Noguchi, of the Rockefeller Foundation, has recently made some very interesting statements regarding the efficacy of his comparatively new yellow fever vaccine, based upon observations made in Central and South America. His vaccine is made from the killed cultures of the Leptospira icteroides. During the recent epidemic of yellow fever in San Salvador, the Noguchi vaccine was used extensively and with good results. Dr. Noguchi has been experimenting since 1919 with a view to determine its efficacy during epidemics. He concludes that the purpose of the vaccine is to provide temporary personal protection only; that the immunity is not lasting nor so general or durable as that induced by smallpox vaccine or by spontaneous infection. Based on the experiments that susceptible animals become resistant to the icteroides infection he assumes that vaccinated persons are protected for a limited time (duration unknown). There are a certain number of protective infections in cases developing in those vaccinated prior to the formation of definite immunity. Dr. Noguchi states that it is extremely rare that a person contracts yellow fever after a lapse of ten days after the last injection. To produce complete immunity two injections are necessary. During an epidemic there is observed a sharp and sudden drop in case incidence among vaccinated persons within ten or fifteen days after vaccination of a group. He concludes that aside from the question of efficacy of the vaccine, nothing should be done at present regarding any modification or relaxation of existing quarantine regulations.

GERMAN SETTLERS INFECTED WITH MALARIA

During the past six months quite a large group of German immigrants have colonized at Capira, Panama, with the intent of clearing the jungles and establishing farms. To date over thirty per cent. of the settlers have been infected with malaria which has handicapped greatly the progress of the work. Capira is in the lowlands and is badly infested with the malaria carrying mosquito. The Panama Government is taking care of the sick and precautions are being taken to prevent the spread to the unaffected. It is practically impossible for a European to settle in this part of the tropics without contracting malaria at some time or another. The transfer of all the colonists from Capira to the Provence of Chiriqui is now being seriously considered by the Panama Government officials. This province is in the highlands, is better suited for the white man and is considered good agricultural country, and is entirely free from mosquitoes. A committee from the Panama Rotary Club is also looking after the interests of the settlers and have made recommendations to the Panama Government to carry out eradicative measures for malaria at Capira. These German immigrants sold all their effects in Germany and migrated for Panama for the purpose of starting an agricultural community. So far their project has been a failure.

NOTED SANITARIAN VISITS SOUTH AMERICA

Assistant Surgeon General John D. Long of the United States Public Health Service and Medical Director of the Pan American Sanitary Service, passed through the Canal recently on his way to Lima, Peru, and other places in South America. Dr. Long was accompanied by Mr. Charles La Gorce, vice-president of the National Geographical Society. Both of these gentlemen are delegates to the Pan American Scientific Congress at Lima. On arrival at the Canal these distinguished scientists were met by Dr. C. P. Knight, chief quarantine officer of the Canal, and escorted across the Isthmus, where they remained until the departure of their ship for South America. Dr. Long and Mr. La Gorce will make an extensive study of health conditions and administration in the South American countries before they return to the United States. Mr. La Gorce is also obtaining material for the Geographical Society.

PAN-AMERICAN SANITARY CONFERENCE

The Pan-American Sanitary Conference which met this year at Havana, Cuba, adopted a sanitary code of sixty-three articles and approved a draft of a model food and drug act. The delegates selected Lima, Peru, for the next conference and elected as their president Dr. Carlos Paz Soldan, professor of hygiene and preventive medicine of the University of Lima. Surgeon General Hugh S. Cumming was reelected director of the Pan-American Sanitary Bureau and Dr. John D. Long was chosen assistant director. Dr. M. G. Lebredo, of Cuba, was elected honorary director of the bureau. The new sanitary code was prepared in the main by Dr. Long, and some of its features include: a provision that the signatory governments agree to designate landing places for aircraft which shall have the same status as a quarantine station. Obligatory reporting at intervals of not less than two weeks is required for epidemic cerebrospinal meningitis, acute poliomyelitis, epidemic encephalitis, epidemic influenza, typhoid fever, paratyphoid fever and the maritime quarantinable diseases. The conference passed resolutions, specifying for the next conference the special study of plague and child welfare and intestinal parasites. Cuba was congratulated upon the formation of its Public Health Service and calling upon other nations which have not done so, to organize their public health service as a stable and definite part of the government, with the chief of the service as a cabinet minister.

FOOD POISONING AMONG JAPANESE SAILORS

During the recent visit of the Japanese warships to the Canal Zone, two hundred sailors of the *S. S. Yakumo* were taken suddenly ill after a hearty meal. Symptoms of food poisoning were present with violent vomiting and purging. The illness was promptly investigated by the medical officers of the ship and laboratory examinations made in order to determine the causative agent of the illness. Investigations revealed the fact that the sickness was caused by dried fish brought from Japan, this being a part of the sailor's ration. Although the symptoms were quite severe, there were no fatalities, and all were able to return to duty in a few days.

Book Reviews

TREATMENT OF DISEASES

Fundamental Principles in Treatment. By Harry Campbell, M.D., B.S., F.R.C.P. Lond. New York: William Wood & Company, 1924.

This is an excellent book, and senior medical students and all practitioners of medicine would be benefited by acquiring the broad view of the treatment of disease and diseased conditions as presented by the author. The medical student quite generally graduates with the idea that the treatment of disease is of minor importance, that the diagnosis and pathology are of supreme importance, while as a matter of fact the science of pathology and the art of diagnosis are means only to the end of therapeutics, and therapeutics may be diet, exercise, medication, or general or special surgery.

The author begins with a description of the requirements of the practitioner for success. He refers to quackeries and the innate tendency of many diseased conditions to be cured by Nature's processes. He emphasizes the study of the patient himself and his habits as modifying the treatment or care that he needs, and decries the running to fads in the treatment of disease by some physicians. While the author is a little too strong perhaps on the influence of heredity, we certainly do inherit our endocrine glands and their activities, which certainly modify disease and diseased conditions. The author is splendidly alert to the dangers of focal infection and especially of mouth infection. His discussion on the character of the blood plasma is well emphasized. Not enough investigation is made of the chemistry of the blood plasma. He gives a long sensible discussion of psychotherapy, and has chapters on fresh air, ventilation, clothing, exercise and rest. He interestingly discusses food and the evolution of diet.

This book will make the practitioner "stop, look and listen" before he treats his patients.

INSULIN

The Insulin Treatment of Diabetes Mellitus. By P. J. Cammidge, M.D. (Lond.), D.P.H. (Camb.). Second Edition. New York: William Wood & Co.; Edinburgh: E. & S. Livingstone, 1924. Pp. v-216.

A concise summary of the properties, mode of action, and sphere of usefulness of insulin, as known today, is presented. The author seems peculiarly fitted for this task, as the manufacture of insulin was commenced in his private laboratory and also because the patients treated by him with insulin were kept under most careful observation for periods of twenty years and more and their state of metabolism was accurately known as a result of exhaustive analyses of the blood, urine and feces. The author is, therefore, entitled to speak authoritatively. Study of the effects of insulin therapy have enabled him to provide a theoretical and practical basis for the classification of glycosurias. This, the second edition of this book, brings the entire subject matter up to date.

The discovery of insulin, the experimental investigations with it, and its method of action are reviewed. It is suggested that insulin is possibly an albumose, as it has many properties of the latter. Its clinical effects include the abolition of glycosuria, the disappearance of ketone bodies from the urine and blood, the reduction of blood sugar, the return to normal of the alkali reserve and the alveolar carbon dioxide, the increased utilization of carbohydrate by the body and well marked clinical improvement. It is a specific for diabetes. At the present time the vegetable kingdom cannot be expected to become a therapeutic source of insulin, as has been suggested.

Endocrine deficiency of the pancreas is no doubt the underlying pathology of diabetes mellitus. Systematic examination of the blood in all cases before insulin treatment is commenced is the safest guide as to whether insulin may be safely given or not, as insulin is not to be given indiscriminately. Intercurrent infectious diseases, acidosis, and gangrene can be successfully combated by the prompt administration of insulin.

The author's methods of insulin therapy are given in detail. The value of physiological rest for the organs of digestion and assimilation of food is emphasized. It is shown that the abnormal conversion of glycogen may be due to the following: 1, changes in the fixed acid to base equilibrium of the blood to the acid side; 2, hyperfunction of the ductless glands other than the pancreas, particularly the pituitary and thyroid; 3, nervous influences. Before insulin therapy is instituted the excessive permeability of the kidneys (renal glycosuria) must be differentiated from true diabetes mellitus.

The treatment also includes the eradication of septic foci, the control of hepatic and renal insufficiency, the assistance of elimination by the introduction of large volumes of fluid into the body, as well as gastric lavage, catharsis, cardiac stimulation, rest in bed and warmth. In general practice an initial period of instruction for the patient is essential.

The Folin and Wu method of estimating blood sugar and the Benedict test for the detection and estimation of urine in the sugar are recommended. The Addendum, including the up to date review of the action of insulin, and the nature of diabetes, the preparation and nature of insulin, the susceptibility to insulin and its administration, clinical notes, and the treatment of nondiabetic conditions, with insulin, is very practical and useful.

PNEUMONIA

The Pneumococcus and Pneumococcal Affections. By L. Cotoni, C. Truche and Mlle. A. Raphael. English Edition by D. S. Page, M.A., M.B.Cantab., D.P.H., Victoria Park, and Eva Morton, M.R.C.S. Eng., L.R.C.P. Lond. London: John Hale, Sons & Danielsson, Ltd., 1924. Pp. viii-218.

This monograph is divided into three parts: 1, the bacteriological study of the pneumococcus; 2, the habitat of the pneumococcus and the diseases of pneumococcal origin; 3, the treatment of such diseases. Emphasis is laid on the well established facts on which future research may be built, especially the studies carried out in M. Nicolle's laboratory. The results of these investigations are also correlated with those of other investigators.

The chapter on the pneumococcus includes studies on its morphology, its cultural characteristics, pathogenicity, evolution of virulence, immunology, agglutination, pneumococcus types and the preparation of antipneumococcus serum. The organisms classed as Streptococcus mucosus capsulatus are included among the pneumococci. Attention is called to the misconception, due to loose terminology, that the type IV pneumococci, which are not agglutinated by the sera of the types I, II, and III, are closely related to one another. The types of pneumococci are essentially agglutination types.

The study of the habitat of the pneumococcus in the intestines, outside the animal body and in the lower animals, tends to support the view that this organism is ubiquitous in the animal kingdom and that it is habitually present in certain mucous membranes in healthy man. The pneumococcus is found in the following body systems: the respiratory, circulatory, alimentary, genitourinary, nervous and special sense organs, ductless glands, locomotor system and the skin. In the colored races pneumococcus infections are more nearly akin to septicemia, or rather septicopyemia. Evidence is brought forth that the crisis in pneumonia should be included among the phenomena of hypersensitivity. The pneumococcus and the streptococcus can be differentiated by direct examination for the presence of the pneumococcus (bacteriological) and by the biological reactions of the blood. The resistance of patients varies in each individual, as does also the virulence of the organism. We can judge only by their combined effect, as expressed by the clinical picture.

The chapter on treatment is mainly a critical study of the value of serotherapy. The value of prophylactic vaccination and bacteriotherapy, as well as of chemotherapy, cannot as yet be estimated.

This work is a valuable résumé of existing knowledge of the pneumococcus. The bibliography is very comprehensive and includes references to French, English, American and German references.

VISUAL DIAGNOSIS

Diagnostik mit freiem Auge (Ektoskopie). Von Dr. Eduard Weisz. Mit einem Vorwort von Geh. Med.-Rat Prof. Dr. Friedrich Kraus. Mit 18 Abbildungen im Text. Berlin und Wien: Urban & Schwarzenberg, 1924. Pp. vi-136.

The ever increasing number of technical aids and laboratory methods has the inherent danger of the neglect of the powers of observation with the naked eye. It is the author's aim to develop the faculty of inspection. Through the observation of respiratory and phonation phenomena and the use of a few technicalities he has developed a special method of investigation, called ectoscopy. With it the physician is enabled to determine a series of noteworthy phenomena at the surface of the body which are of interest not only from a didactic viewpoint, but also have a practical and diagnostic significance.

The signs observable on the moving thorax include the respiratory phenomenon during quiet respiration and rapid respiration, the sniffing phenomenon and the speech or phonation phenomenon. The signs observable on the resting thorax are the sunken ribs and the forms, position and size of the splenic and hepatic islands. Their genesis and localization, both with and without röntgenography, are discussed as well as the technic. The speech phenomenon in the region of the stomach, the signs near the heart and the condition of the phrenocostal sinus are studied and their clinical values are determined. Pleuritis exudates are easily mapped out. This method of investigation is also applicable to neurological conditions.

THE CORTEX

Le Cerveau et la Pensée. Par Henri Piéron. Paris: Librairie Félix Alcan, 1923. Pp. iii, 327.

The author has called to his service the revelations of psychology and the physiological development of the nervous system from its simplest beginnings to its utmost complexities of cortical functioning. Only thus, in the manifestation of function, developing with organism, and dynamically preparing the complicated structure in the organism can the final interrelations of the complicated mechanism be approached in understanding. The contradictions existing between neuroanatomical findings and clinical facts, the failure of expectation thus to solve problems, have kept the cortical field in obscurity. The author's method illuminates where static modes of investigation fail. Piéron considers that, having arrived in development at the high cortical level, we have here an instrument of marvelous refinement for the pursuit of the problems. This is that of the most advanced evolution of language. To this, in the normal functioning and the disturbances of speech, he devotes several important chapters.

PATHOLOGY

Allgemeine und experimentelle Pathologie. Nach Vorlesungen für Studierende und Arzte. Von Dr. Hermann Pfeiffer. Mit 50 Abbildungen im Text und 8 teils mehrfarbigen Tafeln. Berlin und Wien: Urban & Schwarzenberg, 1924. Pp. xvi-594.

The author was impelled to write this book by the lack of an up to date book that is suitable for the needs of the medical student. It is entirely different from the usual type of book on pathological physiology. General pathology is utilized for its highly educational value to enable the student to understand the origin and nature of disease. The material is arranged in such a manner that the reader progresses from the more easily understood to the more difficult subjects. Not only actual knowledge but also the processes of thought and the necessary experimental methods; the how and why of experimental investigation, are emphasized. Only the most important and extensive German references to the literature are cited at the end of each chapter, so as not to distract from the main purpose of the book—teaching. It gives the medical student a broad outlook on the subject of disease from the viewpoints of etiology and pathology. There is nothing like it in the English literature.

After a general discussion on disease processes and the reaction to disease in the body, the various external causes of disease and the resulting diseases are discussed. In this chapter, five different types of results of infection are described under an entirely new classification, which stresses types of reaction. In the subject of inflammation are included the etiological factors, tissue injury, local and

general reactions in the body and the significance of the individual forms of inflammation. A separate chapter is devoted to the study of fever. The various types of immunity and their reactions are discussed. Blood diseases are studied from the point of view of the pathology of its cells and the circulation from that of the general and local disturbances in the body. The chapter on respiratory disturbances is illuminating. In the discussion of the metabolic disturbances, the food elements and their relationship to metabolic diseases and the manner of their affecting the different organs of the body are stressed. The subjects of endocrinology and endocrine disturbances are treated in a most comprehensive and interesting manner. The final chapter on experimental investigations of neoplasms takes up the various theories of causation as they have been promulgated and subjects them to criticism. The author favors the theory that neoplasms, both benign and malignant, are associated with metabolic changes. The purpose of the book is fulfilled.

MOTIVES FOR MURDER

Murder and Its Motives. By F. Tennyson Jesse. New York: Alfred A. Knopf, 1924.

The effort at classification follows a descriptive one and in no way attempts a deeper analysis of the underlying component factors. Unfortunately the book will have only a superficial value. The only way in which the problem can be attacked today so as to serve a purpose of value is to take into consideration the more profound analytical if somewhat more modern psychological concepts.

PHYSICIANS' OATH

The Doctor's Oath. An Essay in the History of Medicine. By W. H. S. Jones, M.A. Cambridge: The University Press, 1924. Pp. 62.

This work on the original oath is a splendid one. It contains the Christian oath which is published for the first time. Many manuscripts have been collected from various parts of the world and subjected to a critical survey. Historians of medicine should appreciate this excellent piece of work which has been presented in a most attractive fashion.

AUSTRALIA

The Boy in the Bush. By D. H. Lawrence and M. L. Skinner. New York: Thomas Seltzer, 1924.

Two things would make this new book of Lawrence's worthy, no matter under what heading: the reality of the boy pictured, and the strange essence he gives to that vast continent so little known to Americans. From the quivering, vaguely self-knowing lad new to the shores of Westralia, to the complete master of his soul that Jack Grant becomes in the end when he casts in his lot with the new country, the being has grown, developed, not so much under our eyes, as, unawarely, within us. How it is done is Lawrence's gift. One cannot spot it, say this makes for such an effect, that hits you there. He probably would not know either how it was done —but it *is* done and masterfully.

The boy is only one of millions who have grown through adolescence to manhood in "the bush." One has a dim feeling of Australia itself like a man in the prime of life, still able to remember whimsically the mistakes of giddy youth, but with the conviction of splendid service given and still to give.

Certain of Lawrence's mannerisms and theses are still being ridden hard. One wonders what M. L. Skinner's contribution was—for not a paragraph but has the tricks of iterative wording that sometimes jar, but nevertheless serve unconsciously to paint the mosaic Lawrence is after. Yet the "feel" of the new land is there, the knowledge that can only soak in after long association. There is perhaps a little more than the usual amount of sensuous imagery,—color—smell—halflights. Yet they are not unfamiliar to Lawrence's style—we find them richly manifest in his poems. Whatever the task of the collaborator it has made for an increase in depth in the book that brings it to the high level of Lawrence's works, sharply contrasting it with *Kangaroo*.

One of Lawrence's pets—the practicability of polygamy (for men only—Lawrence's women apparently do not stop to ponder about it) is aired with the customary frankness. His hero would like to put his theories into practice. Everyone feels he would be quite mad enough to try, so everyone conspires to "save him from himself." But what about the sociological end of it, the deep lying problem of many modern countries in the past twenty years where women have been steadily outnumbering the men? The woman's angle has not come to our attention as much as the growing undertone in Lawrence's books and those of others of his generation. And linked with the frankly tribal polygamous suggestions run others at the same free life level—the associations of young men, friendships, loves, so completely laid bare in *Kangaroo*.

The Boy, and The Bush. Two pictures that we consider well-nigh flawless!

Medicoliterary Notes.

One of Macmillan's recent publications is *The Pipe Book* by Alfred Dunhill, a history of pipe smoking from the earliest written description of the pipe in Ovieto's *History of the Indies* to the present day. Mr. Dunhill writes that the implement referred to by Ovieto was not the pipe as we know it today, but a two pronged, Y shaped tube through which tobacco or other smoke was inhaled by placing the two prongs in front of the nostrils.

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The New York State Department of Labor has issued as *Special Bulletin No. 131* an analysis of one hundred accidents on power punch presses, with suggestions as to the installation of suitable guards on such machines.

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Excavations have recently revealed in the plains of the Indus River in India remains of a civilization more than five thousands years old, a period twice as long as that of which it had hitherto been possible to speak with any certainty. A description of these excavations and the findings has been written for the *Pioneer* by Sir John Marshall, director general of archeology, according to an editorial in the *Manchester Guardian*.

* * *

An interesting and useful map has been issued by the United Hospital Fund of New York which gives information about hospital facilities of the city in great detail and completeness. Ambulance districts, municipal and other hospitals, and some of their outstanding characteristics, street numbers, etc., are given in a form available for quick use.

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Twins are more frequently lefthanded than are the single born, according to investigations conducted at the Siemens

Works, manufacturers of electrical apparatus. Fifteen per cent. of the twins examined were lefthanded, while only seven per cent. of the others qualified as "lefties." Another interesting fact brought to light is that lefthandedness, contrary to general belief, is not hereditary. There seems to be a definite relation between lefthandedness and stuttering, it having been found that 22.5 per cent. of the lefthanded employes were stutterers, while only nine per cent. of the righthanded had this defect of speech.—*Herald-Tribune.*

* * *

Dr. Duncan L. Bulkley, of New York, has recently brought out a privately printed booklet about his life and work. Dr. Bulkley's practice has been for the most part in New York and has extended over a period of more than fifty years. He was one of the founders of the American Dermatological Association and of the American Association for the Study and Cure of Cancer.

* * *

The *Living Age* for January 10th quotes from *Le Temps* of Paris an interesting article by Jean Carrère on The Love Affairs of Stendhal. Stendhal's real name was Henri Beyle, he was French consul to Rome, and the author of a number of well known books of which the most famous perhaps is *L'Amour.* Carrère writes that his ideal in history and legend was Don Juan, yet never a man lived who was more the opposite of the knight of the masterful eyes, for Stendhal was painfully timid, especially with women, and had never a word to say when in their company.

* * *

As a result of the demonstration clinic that has been conducted at the University of Minnesota during the past year by the division on prevention of delinquency of the National Committee for Mental Hygiene, two permanent child guidance clinics have been established—one in Minneapolis and the other in St. Paul. A third clinic, a traveling state clinic from the University of Minnesota, has been developed to conduct clinical examinations and to do educational work directed toward the establishment of a state psychopathic hospital.—*Mental Hygiene Bulletin.*

* * *

Outward Bound, the play by Sutton Vane which had so successful a run in New York last season, has been produced this winter in Vienna, the German version having been made by Richard Beer-Hofmann. Press reports state that it was not so successful at the Josefstädter Theatre as was expected. Among criticisms were those that the plot dragged, that the happy ending was not good art, and that the play was too long and could have been more suitably given in one act.

* * *

Among publications of medical interest is *An Outline of Psychoanalysis,* edited by J. S. Van Teslaar and published by Boni & Liveright. The book is one of the Modern Library series and contains seventeen essays, the first by Freud, and others by Jung, Pfister, Putnam, Jelliffe, Stekel and others. Another book, of a more popular character, is *Safeguarding Children's Nerves,* by Dr. James J. Walsh and John A. Foote (Lippincott). *Educational Measurements and the Classroom Teacher,* by A. R. Gilliland and R. H. Jordan (Century), gives full information about the latest methods and equipment for psychological testing; *Smallpox and Vaccination* by Dr. Benjamin White, Harvard University Press, is a history of smallpox and its care and treatment especially for the layman; *Organic Adaptation to Environment,* edited by Malcolm R. Thorpe (Yale University Press), is a collection of articles by authorities on the subject; *The New Psychology and the Preacher* by Dr. H. Crichton-Miller (Seltzer) is as valuable as his similar works on applied psychology.

* * *

It was very little more than a hundred years ago—one hundred and five, to be exact—that Keats seriously pondered whether he should give up poetry and use the few pounds that remained to him in qualifying as a physician in Edinburgh. Taking fees, he said, was not so bad as "writing poems to be hung up and fly blown on the review shambles."—*Manchester Guardian.*

* * *

One of the most widely read books in Germany, according to book news from the Continent, is Alfred Kerr's *New York and London,* published in Berlin by Fischer. The author is a dramatic critic who has recently visited this country and the British Isles. He has much to say naturally of the American theatre and drama, especially the activities of the Theatre Guild; he describes New York as "gloriously impulsive . . . glowing with color . . . and having a genius and a future."

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At the invitation of the Massachusetts Institute of Technology, a working conference in health education will be held on June 23d-28th at Cambridge.

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Among American towns that have recently established the Beccari system of garbage disposal and found it most efficacious are Paterson, N. J., and Scarsdale, N. Y. The Beccari system, the invention of Beccari of Florence, Italy, was described in a recent issue of *The Journal.* It operates by natural fermentation carried on in cells and chambers and is simple in construction and inexpensive to build.

* * *

One of the most interesting novels of the year is *A Naked King* by Albert Ades, whose earlier collaborations with Albert Josipovici, *Les Inquiets* and *Le Livre de Goha le Simple,* are both well known, especially the latter which was published in English under the title *Goha the Fool.* According to the reviews, *A Naked King* is not so great a work as *Goha,* but is nevertheless a remarkable character study as well as an unusually interesting story. It is a portrait of a painter and a genius, with a background of Paris life.

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According to a late report by Dr. Hoffman, the suicide record for eighty cities remained the same for 1923 as for 1922, namely, 15.2 in 100,000 population. The rate increased in thirty-four cities and decreased in forty-six. San Diego had the highest rate for both years. Cities with high rates were on the Pacific coast, while cities of the lake region showed low rates. Boston had a rate of 16.4, Manhattan and the Bronx 16.3, Philadelphia 14.4. and Washington 14.4.

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A critical biography of unusual interest is Dr. Karl Obenhauer's *Friedrich Nietzsche* published at Jena by Diedrichs. A recent review has characterized the book as "done without hysterics, delusion, or social astigmatism."

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The October issue of the *American Journal of Public Health* is a number of unusual interest. It contains, among other articles, The Outlook for International Vital Statistics, by Edgar Sydenstricker; Offensive Tastes in Public Water Supplies, by Dr. Charles F. Dalton; The Present Status of Health Education, Physical Education and School Medical Inspection, report from the Child Hygiene Section of the American Public Health Association; and an editorial giving statistical and other information showing that Public Health Work Pays.

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The Triumph of Lord Palmerston, by B. Kingsley Martin, is not wholly, as the title implies, the study of an episode in the career of a famous statesman, but of the attitude of England before and during the Crimean war. Its chief value lies in its true and brilliant analysis of crowd psychology in war time, and it is a real and significant contribution to the literature of this subject. The book is one of the late publications of the Dial Press.

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The enormous increase within recent years of divorces in central Europe, coupled with the disordered economic conditions, have left numerous divorced wives and their children totally without provision, which doubtless accounts for the publication of a new semi monthly magazine in Prague entitled *The Divorced Wife.*

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An exhibit showing the ravages of the Japanese beetle has recently been installed in the American Museum of Natural History. Dr. Lutz, curator of the museum, is quoted as having said that this insect may cause one of the worst insect scourges that has ever attacked the United States. The beetle has already made its appearance in New York City.

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That the conservation of human energy is the greatest of all economic problems is the main contention of a new book by Prof. T. N. Carver of Harvard, entitled the *Economy of Human Energy.* Macmillan is the publisher.

Abstracts from Current Literature

CARDIOVASCULAR DISORDERS

Congenital Stenosis of the Conus Arteriosus.—Hermann Müller, Jr. (*Schweizerische medizinische Wochenschrift,* July 31, 1924) states that the uncomplicated congenital stenosis of the conus arteriosus is a relatively benign congenital lesion unassociated with cyanosis and compatible with long life. In the simple cases, not complicated by other cardiac malformations, the diagnosis can be made in life. This lesion is not rare, but heretofore it has been known too little to be diagnosed more often. It is characterized by a powerful, heaving apical impulse with a hardly perceptible pulse, by a loud systolic murmur and marked fremitus over the left ventricle, the aorta and the carotids and by the presence of the second aortic accentuation; the left ventricle is usually enlarged; the ascending aorta shows marked pulsation under the fluoroscope and is sometimes dilated. The first cardiac sound is often split; the second aortic sound may be accentuated. The pulse is sometimes retarded, but more often not. The right chambers of the heart are rarely also dilated and hypertrophied. The presence of malformations outside of the heart and bodily underdevelopment are noted exceptionally. There is no special predisposition to pulmonary diseases, as there is other congenital valvular lesions. Anatomically, diaphragmlike, ringshaped folds and valvelike formations are the cause of the stenosis. These are situated 0.5 to 1.0 cm. below the intact aortic valve and usually surround an opening of about 1.0 cm. in diameter. The left ventricle is usually markedly hypertrophied and slightly dilated. The ascending aorta is sometimes dilated. In a few cases the right heart chambers are also hypertrophied and dilated.

Periarterial Sympathectomy.—Kenneth Black (*British Medical Journal,* August 2, 1924) states that arterial decortication has been performed for various surgical conditions, but its utility seems to be greatest and the results obtained most encouraging in cases of trophic ulcerations of the extremities. Especially favorable results have been reported in perforating ulcer of the foot. In ulcers of the legs or feet it gives good results provided the ulcers are not very old or surrounded by much scar tissue. It has been tried with no inconsiderable success in Raynaud's disease, in frostbite gangrene, ischemic paralysis of the forearm, painful stumps, trophic contractions of muscles, and in some chronic cases of pains in the hands and feet (erythromelalgia). In two of the author's cases of ulcerations of leprosy the results were remarkable. This result warrants further trial in leprous ulcerations and also in Dupuytren's contracture. Decortication of the common carotid artery has been done for glaucoma and for trophic ulcer of the cornea, but no final conclusion can as yet be given in these cases. The operation is contraindicated in diabetes, in renal, hepatic, or cardiac disease, and in arterial degeneration. No bad symptoms have been observed after this operation.

Rheumatic Lesions of the Left Auricle of the Heart.—W. G. MacCallum (*Bulletin of the Johns Hopkins Hospital,* October, 1924) has noted several times in cases of rheumatism a marked thickening of the wall of the left auricle above the base of the more posterior leaflet of the mitral valve. This roughened patch somewhat resembles the vegetations so commonly found there in cases of endocarditis produced by the streptococcus viridans, but is evidently more largely produced by a new growth of tissue, and to a less extent by the deposition of rough fibrin on the surface. Though the surface is sometimes corrugated, it does not seem to be roughened by any thrombus mass. In several cases the thickened patch was very dense and scarlike, as though representing the late or healing stage after the subsidence of an earlier process. Microscopically there are changes in the wall of the auricle and in the tissue about the auriculoventricular junction and the enclosed coronary vessels as well as in the roots of the valves which resemble those found in the myocardium of the left ventricle, but far more extensive. There is great edema and actual new formation of tissue lifting up and spreading apart the inner wall of the auricle inside the muscle. The lining layer of the auricle, very rich in laminated elastic fibrils bound together by intervening fibrillæ, is spread apart by fluid and a great infiltration of wandering cells of many sorts, mostly mononuclears, but many polynuclears, and even lymphatic channels filled with lymphocytes formed a peculiar and rather conspicuous feature. The most striking thing was the numerous large Aschoff bodies composed of the characteristic large cells with large, deeply staining vesicular nucleus and indefinitely outlined cell body.

Spontaneous Interstitial Myocarditis in Rabbits.—C. Philip Miller, Jr. (*Journal of Experimental Medicine,* October, 1924) presents a report on the hearts of thirty-four apparently healthy adult rabbits, twenty, or sixty per cent. of whom showed myocardial lesions. On microscopic examination they were found to be distributed as follows, in order of frequency: papillary muscles, septum, left ventricle wall, right ventricle wall, auricles. No lesion was ever found in the valves or at the bases of the valves. The lesions consisted of lymphocytes and endothelial leucocytes in varying proportions, to which were sometimes added polymorphonuclear eosinophiles, plasma cells, and fibroblasts in small numbers. No microorganisms or cell inclusion bodies were found in the lesions.

Observations on the Respiratory Gases in Ventricular Paroxysmal Tachycardia.—Francis R. Dieuaide (*Bulletin of the Johns Hopkins Hospital,* August, 1924) reports a case of paroxysmal tachycardia of ventricular origin in which neither digitalis nor quinidine (separately administered) prevented or terminated the paroxysms. Quinidine was apparently followed by an unusual bigeminal rhythm due to ventricular contractions which were followed by the auricles. During the paroxysms retrograde heart block sometimes appeared. There was a decrease in the oxygen saturation of the arterial blood. There was also a significant reduction in the vital capacity. During an attack of tachycardia the basal metabolism showed an increase of sixteen per cent. The respiratory gases and basal metabolic rate were normal during the normal cardiac mechanism.

Transient Hemiplegia, Aphasia and Blindness in a Case of Aortic Insufficiency.—Barré and Cahn (*Presse médicale,* August 2, 1924) report a case of pronounced aortic insufficiency, with apparent good health, in which rightsided hemiplegia and aphasia developed and vision in the right eye was completely lost. After a few days the paralysis of the arm receded and disappeared. Motility of the lower extremity returned abruptly. Vision in the affected eye was restored in a few days, the pupil being, however, found still dilated and slightly less responsive to light. Such disorders are allied to those regarded as nervous disturbances due to circulatory spasm, and aortic insufficiency greatly favors the development of spasmodic circulatory manifestations.

Coronary Arterial Occlusion.—Herbert C. Gordinier (*American Journal of the Medical Sciences,* August, 1924) maintains that this presents a perfectly definite symptom complex, of which the following are the salient features: 1. Sudden severe anginoid pain, substernal or upper abdominal. 2. A pinched ashen gray or very pale facies, often associated with the sensation of impending dissolution. 3. An acute emphysematous distention of the lungs, with dyspnea or extreme orthopnea and moist crackling râles at the bases of the lung, together with the evidences of the acute onset of cardiac decompensation. 4. An easily compressed rapid thready pulse, which may present almost any form of arrhythmia. 5. A sudden drop in the systolic pressure following the severe pain and early myocardial exhaustion. 6. A cardiac impulse, if palpable, that is a diffuse feeble tap, distant heart sounds and often a tic-tac or gallop rhythm. 7. A localized pericardial friction rub, which is evanescent, appearing as early as a few hours or a day or two after the sudden onset of the agonizing pain. It may be missed if the infarct involves the posterior aspect of the heart. 8. A fever of short duration and of a mild type associated with a polymorphonuclear leucocytosis. This does not occur in simple angina pectoris. 9. Inversion or isoelectric position of the T wave, with arborization block. 10. Associated with the above described symptoms, the presence of a large tender liver, together with the symptoms and physical signs of pulmonary infarction, is suggestive of

thrombosis of the right coronary artery or its branches, while the sudden onset of pulmonary edema or recurring attacks, together with the development of sudden arterial plugging of the vessels of the brain, viscera or extremities, with the characteristic electrocardiogram, is highly suggestive of thrombosis of a branch of the left coronary artery.

The Pathogenesis of Dissecting Aneurysms.—R. G. Whitman and Herman B. Stein (*Journal of Medical Research,* September, 1924, describe a case of dissecting mesaortitis in which there was an extensive splitting of the aorta and its branches at the arch with the formation of a large aneurysmal sac, containing only lymph. There was no break in the continuity of the intima. This case, the authors believe, establishes the socalled dissecting mesarteritis of Babes and Mironescu on a firm foundation as a separate disease entity, and as the most frequent cause, at least, of dissecting aneurysms. It also brings strong support to the theory of Krukenburg that a dissecting aneurysm may arise by hemorrhage from the vasa vasorum, instead of from the lumen proper.

Lesions of the Aorta Associated with Acute Rheumatic Fever, and with Chronic Cardiac Disease of Rheumatic Origin.—Alwin M. Pappenheimer and William C. Von Glahn (*Journal of Medical Research,* September, 1924) studied the aortas from seventy-six rheumatic patients, and those of seventy-seven controls dying from various conditions. A series of aortas from syphilitic patients was also included for comparison with the lesions in the rheumatic group. A detailed histological description is given. The rheumatic group showed certain lesions in a much higher percentage than in the controls, and these lesions seem to be characteristic of rheumatic infection. The most distinctive lesions were dense scars in the vicinity of the nutrient vessels, often acellular, and Aschoff cells or nodules in the adventitia.

Some Cardiac Effects of Atropine.—Robert Dawson Rudolf and F. M. R. Bulmer (*American Journal of the Medical Sciences,* November, 1924) say that atropine has two distinct effects upon the heart rate when this is regular. In small doses it merely slows it, probably by stimulation of the vagal centres. In large doses, of course, it hastens it by paralyzing the vagal endings in the heart. It also then tends to remove any existing heart block. If the dose is neither large nor small there will be no change in the heart rate, the two effects of stimulation of the vagal centres and partial paralysis of the nerve endings neutralizing each other. As already mentioned, individuals vary very much in their reaction to atropine. In most adults one one hundredth grain will merely slow the heart, in some no effect will occur while in a few a slight hastening sets in. In the last two groups it is usually only necessary to lessen the dose to get the slowing effect.

Physiological Processes of Acclimatization to High Altitudes.—A Loewy (*Schweizersiche medizinische Wochenschrift,* May 29, 1924) states that the proper acclimatization to high altitudes depends upon changes that are directed against the reduction of the pressure of the oxygen and have for their purpose the increased access of oxygen to the tissues. The increase in the frequency of the pulse and of respiration must be considered as the effect of the unaccustomed climatic stimulation. The saturation of the blood with oxygen at a relatively slight altitude (1550 metres) is almost as extensive as in the valley and does not explain the initial dyspnea with muscular work. At a level of more than 3000 metres and with a corresponding dilution of air in the penumatic chamber the alkalinity of the blood is reduced more markedly with muscular work and abnormal acids appear in greater abundance. An increase in the total volume of the blood, particularly of the hemoglobin and of the number of the cells, anisocytosis and polychromasia as an expression of an increased delivery of erythrocytes into the blood and an increased gaseous metabolism have been recently demonstrated, as well as an increased combination of the oxygen with blood pigment. Other signs of acclimatization are the increase of the respiratory volume, of the tension of the oxygen in the alveoli, of the circumference of the thorax and of the vital capacity. Finally, the pigment formation in the skin must also be looked upon as a sign of acclimatization, which pigmentation protects the more deeply lying layers against the inflammatory effects of the ultraviolet rays.

Partial Occlusion of the Aorta with Silk Sutures, and Complete Occlusion with Fascial Plugs.—Mont R. Reid (*Journal of Experimental Medicine,* September, 1924) produced by means of Halsted mattress sutures of silk partial occlusion of the thoracic aorta of dogs in two cases, and of the abdominal aorta just above the inferior mesenteric artery in six cases, in all of which the partial occlusion persisted. Complete occlusion (without infection or hemorrhage) of the aorta of dogs by means of fascial plugs was produced by the method described. The wall surrounding an occluding fascial plug does not die, though it atrophies for a considerable distance below the occlusion, whereas the wall above maintains its normal thickness and size. Ligatures and encircling metallic bands used for ligating or plicating large arteries cause death of the arterial wall. The use of catgut for the ligation of large vessels is dangerous, as it may give way before the necrosed wall becomes completely substituted by fibrous tissue.

A Cardiovalvulotome.—Claude S. Beck and Elliott C. Cutler (*Journal of Experimental Medicine,* September, 1924) have devised a surgical method and instrument applicable to the treatment of mitral stenosis. A valvulotome has been made which is a powerful cutting device which will actually excise a piece from the stenosed ring and remove the piece from the blood stream. The efficacy of the instrument has been tested by its use on the stenotic valves of diseased hearts removed at autopsy. Its feasibility has been shown by operation on animals and in a single human case in which a segment of the stenosed mitral valve was excised and removed from the heart.

A Comparative Study in Digifolin Administration.—Norman E. Clarke (*American Journal of the Medical Sciences,* August, 1924) made a comparison of different preparations of digitalis given by different methods. In comparing the rapidity of action as measured by the slowing of the heart rate it was noted that an average slowing of the rate is obtained between three and four hours by intravenous, say about four hours by intramuscular, and at six hours by oral administration. The amount of digifolin required to show the earliest and full therapeutic effects is about equal for intravenous and intramuscular injection. By oral administration is required about half again as much of the drug. The average time required for digifolin to show the earliest and maximum effects with the three methods of administration has been obtained. The comparison of these time intervals closely approximates the comparison of the digifolin requirements. Intensive therapy may yield an unfavorable result. The use of digitalis by other than the oral method is not advocated. An important factor in treatment is the cost of different preparations of digitalis.

Operation Shock.—J. Fraser (*British Journal of Surgery, January,* 1924), reaches the following conclusions regarding the nature of surgical shock. The essential underlying factor in the production of the shocked condition is a prolonged and progressive fall in blood pressure. The causes which inaugurate the original fall are various; some are nervous, some are clinical, in many instances there is a combination of causes; hemorrhage, sepsis, and the absorption of toxic products from injured tissues are collateral and sustaining factors of great influence. With the establishment of a persistently low blood pressure something of the nature of a vicious circle comes into play, the prolonged hypotension leads to imperfect oxygenation of the body tissues, and to a capillary stasis; the capillary stasis reduces the amount of blood in active circulation, and the imperfect oxygenation of the tissues results in the formation of various toxic products from imperfect tissue metabolism. These influences collectively further reduce the blood pressure, the vicious circle is maintained, and the tendency is for it to continue to a fatal issue unless some link in the chain is broken and the hypotension error is overcome.

As to its physical manifestations, the influences of general anesthesia and surgical operation upon shock, and their respective remedies, he offers the following: If, during the progress of a surgical operation of any magnitude, certain investigations are made, it will be found that three changes have appeared: 1. There is a lowering of the systolic blood pressure. 2. Examination with the hematocrit shows a gradually increasing concentration of the blood. 3. There is a reduction of the alkali content of the plasma. In fact, during the progress of the operation there has been

the inauguration of the three processes which have such an important influence upon the institution of the shocked condition. In the large proportion of cases these various changes are so slight that little clinical evidence of their presence is apparent, but none the less they are the basis of shock, and under unfavorable conditions they may assume dangerous proportions. If the development of these features is to be kept within the limits of safety (their complete avoidance is impossible), certain precautionary measures are necessary, and these may be summarized as follows:

1. Operation in a case which shows persistent low blood pressure should be delayed, if possible, until means have been taken to raise the blood pressure. 2. The operative procedure should be as short as is consistent with thoroughness. 3. The operation should be carried out with the least possible interference and trauma. Every effort should be made to avoid unnecessary loss of blood. 4. Chilling of the patient before, during, or after the operation must be avoided. 5. If it is possible to exercise a choice of anesthetic, nitrous oxide and oxygen should be chosen. 6. If simple restorative measures have failed to raise the blood pressure before operation, it ought to be raised artificially by the intravenous infusion of human blood or of one pint of six per cent gum acacia solution in normal saline. 7. If examination of the blood shows that a condition of acidosis is present before operation, a reserve of alkali should be built up by the intravenous infusion of one pint of four per cent solution of sodium bicarbonate.

Orthopercussion with an Improved Threshold Percussion.—I Révai (*Wiener Archiv für innere Medizin*, April 1, 1924), advises the following technic: The terminal phalanx of the finger is placed over the area of cardiac dullness and the rest of the finger is kept at rest at an angle of forty-five degrees to the chest. Percussion on the finger continued proximally reveals absolute dulness near the first interphalangeal joint. When the finger plessimeter reaches the cardiac border the sound becomes suddenly clear. The author believes that this method of percussion may also be applied to the liver, kidneys and, especially, to the lungs.

Action of Quinidine on the Amphibian Heart.—J. A. Waddell and Morris Cohen (*Journal of Laboratory and Clinical Medicine*, September, 1924) employed turtles and frogs for this work. From this study it is concluded that quinidine produces its effect through action on the musculature of the heart, including that of the conducting system With moderate doses, there is no evidence of permanent tissue damage, all effects being abolished by withdrawal. Quinidine seems to be a physiological depressant, analagous to ether on the brain and cocaine on nerves.

Action of Potassium Iodide on the Circulation.—The work of D. Bloom (*Schweizerische medizinische Wochenschrift*, May 15, 1924) shows that more than half of the twenty-three patients examined exhibited a lowering of the blood pressure (ten to forty mm. of mercury) and also an increase of fifty per cent. in the pulse volume and an increase of seventy-five per cent. in the pulse frequency (three to thirty-three beats) and with one exception never a fall several days after the administration of even one gm. of potassium iodide by mouth. Consequently potassium iodide is a circulatory remedy; it makes the work of the heart easier through dilatation of the bloodvessels, it increases the number of pulse beats, and it increases the pulse volume.

The Myocardium in Noninfectious Myocardial Failure.—B. J. Clawson (*American Journal of the Medical Sciences*, November, 1924) has studied the anatomical changes in the myocardium in myocardial failure resulting from hyperpiesia, chronic glomerulonephritis, right ventricular hypertrophy, defective valves, luetic aortitis and adherent pericardium, and found no anatomical changes except coronary sclerosis and myocardial fibrosis. Coronary sclerosis of serious degree was present in 22.5 per cent. Myocardial fibrosis was found in a marked or moderate degree in 20.5 per cent. and in a slight degree in thirty per cent. There is usually a close correspondence between the situation and extent of myocardial fibrosis and the distribution and degree of the coronary sclerosis. Myocardial fibrosis is usually due to coronary disease, but occasionally rheumatic infections may give rise to a slight degree of fibrosis. Myocardial strain (hypertensive or nonhypertensive) is not a cause of myocardial fibrosis. Luetic myocarditis is rare. Myocardial failure is rarely due to anatomical changes in the myocardium. It may be explained as an exhaustion of the cardiac muscle. True chronic inflammation of the myocardium is very rare. What is commonly called chronic myocarditis is usually myocardial fatigue resulting from the various conditions mentioned above. Approximately half of the cases of myocardial failure show no anatomical changes in the heart muscle. The anatomical changes in the heart muscle are seldom sufficient in themselves to cause death.

A Preliminary Study of the Blood Pressure Following Reduction of Renal Substance.—James R. Cash (*Bulletin of the Johns Hopkins Hospital*, June, 1924) began these studies with the attempt to produce a renal insufficiency by excision of kidney tissue, and by ligation of renal vessels, in previously normal dogs upon which studies of blood pressure, blood chemistry, and blood volume had been made after operation, the studies were continued for two to four months. The total kidney substance was reduced at least fifty per cent. and a portion of the kidney which had been deprived of its circulation was allowed to remain *in situ*. A moderate elevation of both systolic and diastolic blood pressure occurred. No associated renal insufficiency, as manifested by chemical changes in the blood, was noted but where large amounts of kidney tissue were removed or rendered incapable of function by ligation of the renal vessels, the total output of phenolphthalein was decreased. There were no significant changes in the blood volume.

Elevation in Blood Pressure Produced by Guanidine Compounds.—Ralph H. Major and Walter Stephenson (*Bulletin of the Johns Hopkins Hospital*, June, 1924) found that guanidine, methyl guanidine and dimethyl guanidine salts produced a marked and prolonged rise in blood pressure, accompanied by a slowing of the heart and a decrease in the respiratory rate. The rise thus produced may be promptly abolished by the use of calcium chloride, either alone or combined with potassium chloride. These experiments prove that substances normally excreted by the urine have a marked and prolonged pressor effect.

Capillary Microscopy at the Nail Groove.—Ferdinand Schreiner (*Zentralblatt für Gynäkologie*, March 15, 1924) finds that the stases observed in the capillary system of the nail groove do not depend upon angiospastic condition of the entire organism in eclampsia and its premonitory stages as otherwise all the capillaries in the field would have to show similar circulatory disturbances and stases at the same time. These angiospasms have been shown to be the result of a stimulation of the vasomotor centre, because stases and increase of blood pressure are not associated.

Danger of Pregnancy in Heart Disease.—D. Grant Campbell (*Medical Clinics of North America*, May, 1924) draws the following conclusions:

1. Certain heart conditions are very adversely affected by pregnancy, and it constitutes for them a very real complication. Included in this group are auricular fibrillation, myocarditis, and mitral stenosis.
2. Marriage and pregnancy are not justifiable in cases of auricular fibrillation or myocarditis.
3. Should any woman after marriage present either of these conditions and subsequently become pregnant, she should be aborted and sterilized.
4. Cases of mitral stenosis with no evidence of myocarditis or of previous heart failure are capable of bearing one or two children with safety if carefully watched, but each pregnancy damages the mother's heart very considerably.
5. With close attention to the signs and symptoms of heart failure, as evidenced by breathlessness, palpitation, precordial pain, and râles at the bases of the lungs, one can forestall a breakdown in cases of mitral stenosis by interference, either by induction or by section, according as the special case may indicate.
6. Unless specially indicated, abdominal Cæsarean section is not as satisfactory a method in cases already showing some heart failure as induction of labor or vaginal section.
7. Certain other heart conditions are not much affected by pregnancy, and there is no need to advise against marriage on account of the lesion itself. This group includes mitral regurgitation, aortic regurgitation, aortic stenosis, and the congenital lesions.
8. Finally, it is evident that it is the heart muscle that is the factor of importance, and that all other factors are of consequence only in so far as they may involve it.

INFECTIOUS DISEASES

"Spasmodic" Diphtheria.—C. W. Ronaldson (*British Journal of Children's Diseases,* July-September, 1924) states that diphtheria may be complicated by spasmodic nervous symptoms. They are most likely to be met with in patients who exhibit a nervous predisposition. Such symptoms are rare, and it is doubtful if they can occur in patients who have not suffered from a diphtheritic angina. Further proof is necessary before we can admit a diphtheritic origin for symptoms met with in subjects who show no clinical signs of diphtheria.

Intravenous Injection of Antitoxin in Diphtheria.—Donald MacIntyre and D. W. McKay (*Lancet,* June 21, 1924) are convinced that the intravenous injection of antitoxin is of great value in severe cases of diphtheria. The toxic symptoms subside much more rapidly than after an intramuscular or subcutaneous injection. The onset of paralysis also appears to be diminished. The authors were impressed by the number of cases in their series in which there was no paralysis. On the other hand, they do not advocate giving antitoxin intravenously in mild and moderate cases, where intramuscular injections have proved sufficient. As the reaction which usually follows an intravenous injection is sometimes severe it seems unnecessary in moderate cases to expose patients to the discomfort of such a reaction. For this reason they have only used the intravenous route in severe cases where there has been a definite risk of the disease proving fatal. The injection itself is simple and comparatively painless and it can be performed in young children.

Scarlet Fever Otitis.—E. H. R. Harries and F. Brayshaw Gillespy (*Lancet,* April 26, 1924) describe the clinical manifestations of scarlet fever otitis as follows: 1. The onset in about half of the cases is painless; if occurring in the acute stage of the disease, pain is more likely to be complained of than when the complication arises during the convalescence. 2. A small rise of temperature should always suggest an examination of the ears. The rise often precedes the otitis by a day or more. Timely paracentesis in these cases should be of value. 3. Symptomless discharge may be the first indication. In early life the membrane ruptures extremely easily, probably owing to its finer texture at this age. This mode of onset is more common in children under five. 4. Mastoid complications are rare under five years of age. Scarlet fever does not, as a rule, cause a rapid destruction of the membrane in the early stages of the disease if properly treated. Large perforations very often completely heal before the patient is discharged from the hospital. This fact is important from the point of preventive medicine, for an ear with perforation is more prone to future attacks of suppuration than if the membrane were intact. Early and energetic treatment is the most economical means of dealing with this large class of patients.

Indications for the Radical Mastoid Operation in Otitis Media Purulenta Chronica.—H. H. Burnham (*Canadian Medical Association Journal,* May, 1924) says that there are two clinical indications on which the surgeon should base his decision whether to wait until the more acute symptoms have subsided, or to operate at once for the safety of the patient. These are, 1, any danger signs, and 2, the type of infection. Danger signs include indications of meningeal irritation, headache, photophobia, tonic spasm such as affects the muscles at the nape of the neck, vomiting and many other of the well known symptoms of meningeal irritation. Important as a warning would be increasing signs of labyrinthine involvement, such as impairment of hearing, vertigo, vomiting, nystagmus, and signs of involvement of the lateral sinus as indicated by the two cardinal symptoms of fluctuating temperature, chills and positive blood culture; the latter in particular in the absence of any other possible source of a septicemia such as pneumonia or erysipelas. Lastly, one must look for symptoms leading to a suspicion of extradural or brain abscess In the absence of rapid disappearance of these danger signs, it may be considered safe to allow the more acute inflammatory action to subside. The advantage gained is the limiting of the progress of invasion by an efficient wall of defence. If now the operation is carried out every use should be made of the natural barrier formed by the inflammatory process. It should be left undisturbed unless hiding a deep seated focus of infection.

The type of infection with which one is dealing is of far more practical value, as a rule, than is generally believed. If the streptococcus be found in the discharge, the chances of cure without operation are much lessened and the danger of waiting much increased. If Streptococcus capsulatus is found, it is considered a positive indication for operation. This infection gives rise to such an insidious process that clinical signs are ill marked and grave damage may occur without any danger signs having arisen. Much of this information can be obtained by examination of the discharge before operation. If, for example, the Streptococcus hemolyticus be found on direct smear or after cultivation it is quite reasonable to surmise that this coccus is responsible for the acute process. And it is undoubtedly of additional value in forming a judgment as to the prognosis in the case.

Acute Pyogenic Parotitis in Otherwise Healthy Individuals.—Roy G. Spurling and Fred W. Stewart (*Boston Medical and Surgical Journal,* May 15, 1924) say that pyogenic parotitis in otherwise healthy persons does occur, and perhaps more frequently than is generally recognized. The condition must be distinguished from mumps, lymphadenitis, neoplasm, and cellulitis of the face and neck. The diagnosis may be made with certainty by careful observation of Stenson's duct and by catheterizing the duct in doubtful cases. The catheter specimen obtained from the parotid duct in septic conditions of the gland will yield an abundance of polymorphonuclear leucocytes and a pure culture of organisms. Expectant treatment should be carried out until definite fluctuation occurs, then surgical drainage should be established. The cases of pyogenic parotitis in otherwise healthy individuals tend to run a mild course and a spontaneous recovery is often made. On the other hand, when the condition occurs in a severely debilitated patient, the condition is much more serious and the prognosis should be guarded.

Treatment of Scarlet Fever with Dochez's Antiscarlatinal Serum.—Francis G. Blake (*Boston Medical and Surgical Journal,* July 10, 1924), says that a clinical and laboratory study of Dochez's antiscarlatinal serum has shown that it is a valuable therapeutic agent in the treatment of scarlet fever. The observations which warrant this conclusion are as follows:

1. Intracutaneous injection of the serum in patients with scarlet fever produces a local blanching of the rash at the site of the injection.
2. Intramuscular injection of the serum in therapeutic doses early in the disease is followed by rapid clinical cure, as evidenced by critical fall of temperature and pulse to normal, rapid fading of the exanthem, and prompt return to a state of well being.
3. The specific toxic substance present in the blood of patients with scarlet fever is neutralized in vitro by Dochez's serum. It promptly disappears from the blood following serum treatment.
4. The blood serum of scarlet fever patients acquires the capacity to blanch the rash in scarlet fever within a few hours after serum treatment.

Prophylaxis of Measles with Defibrinated Adults' Blood.—The results obtained by Helmut Gerlach (*Monatsschrift für Kinderheilkunde,* June, 1924), with the injection of adults' defibrinated blood for the prevention of measles were disappointing unless at least thirty c.c. of such blood was used for infants three to twenty months of age. At least forty c.c. had to be given to the older children. In only one patient of the fifteen treated did measles develop after the use of the smaller dose and in none of the three treated with the larger dose.

An Early Diagnostic Sign in Measles.—I. H. Goldberger (*Archives of Pediatrics,* June, 1924) noticed with unusual regularity, that children seen both in the preeruptive and in the eruptive stages of measles presented spots of a definite character on the swollen caruncle at the internal canthus of the eye. These spots are similar in color and in appearance, yet smaller in size, than the Koplik spots. During the eruptive stage of the disease, the spots have a tendency to coalesce giving the appearance of one large spot, but in the preeruptive period the spots appear isolated, pinpoint in size, from two to four in number, and bluish white in color. Both caruncles are usually involved. The eye spots can be seen from twenty-four to forty-eight hours before the appearance of Koplik spots, and in many

instances they have been recognized forty-eight hours prior to the onset of even the catarrhal symptoms, and if this sign is sought and found many children may be spared an unnecessary exposure. This eye sign has not been observed in scarlet fever or in other exanthemata.

Treatment of Pertussis with Intramuscular Injection of Ether.—Cleon C. Mason (*Archives of Pediatrics,* June, 1924) treated twenty-six cases of pertussis by the deep intramuscular injection of ether with very good results. The ether injections were made with a long, fine platinum needle, deep into the buttocks. Commercial anesthesia ether was used. The doses used were: First day, 0.5 c.c., two injections; second day, 1.0 c.c., two injections; third day, 1.5 c.c., two injections; fifth day, 2.0 c.c., one injection; each day thereafter, the same amount as on the fifth day. The injections did not seem especially painful.

The results were as follows: sixty per cent. of the patients stopped coughing and were apparently cured; twenty-four per cent. were definitely benefited; sixteen per cent. failed to respond or became definitely worse. Recently four additional cases were treated by the high rectal injection of 6.0 c.c of a forty per cent. ether solution in olive oil. These injections were repeated every six hours. Two of these patients stopped coughing quite promptly, and two failed to respond. This treatment can be carried out at the home.

Treatment of Chickenpox.—F. H. Thomson (*Clinical Journal,* August 13, 1924) advises the following: Most cases of chickenpox require little treatment, but it is necessary to take care that the lesions do not become infected. The patient should be kept in bed, and the lesions dusted with a powder of equal parts of boric acid, starch and zinc oxide. If the eruption is copious the patient should be bathed night and morning in a boric acid bath (one ounce of boric acid to one gallon of water). Indeed, the powdering and the bath relieve the itching. If pustules form on the face they should be incised, evacuated and cleansed with boric acid solution in order to avoid pitting. When crusts form, zinc ointment should be applied.

Bacteriophage in the Treatment of Typhoid Fever.—The bacteriophage employed by J. Smith (*British Medical Journal,* July 12, 1924) in the treatment of seven cases of typhoid fever was isolated from the feces of a normal individual who never had had an intestinal infection. It was obtained by the technic devised by d'Herelle. A bacteriophage showing some power to cause lysis of the bacillus typhosus having been obtained, its virulence was enhanced by filtering the broth culture through a bacterial filter and adding five drops of the filtrate to another broth tube along with a suspension of bacillus typhosus. The second broth culture was then incubated and afterwards filtered. By repeating this process fifteen times a bacteriophage of such virulence was obtained, that it produced lysis in a broth culture of bacillus typhosus in three to four hours. In five cases an immediate lysis occurred after the administration of the bacteriophage. In the two remaining cases, in which the blood culture showed the presence of bacillus typhosus, the bacteriophage had apparently no effect in modifying the course of the disease. The strains of bacillus typhosus obtained from the blood, the urine and the feces of the various patients were equally susceptible to the bacteriophage in vitro.

Pulmonary Amebiasis.—Philip Manson-Bahr (*Lancet* September 22, 1923) concludes as follows: 1. Pulmonary amebiasis may develop independently of hepatic abscess. 2. The pulmonary condition may simulate those of a bronchopneumonia or miliary tuberculosis. 3. The diagnosis is based upon the previous evidence of amebiasis, the leucocytosis, and the remarkable and lasting response to emetin and ipecacuanha. 4. Rupture of a hepatic abscess into the lung may take place without previous warning or the coexistence of hepatic symptoms. 5. The resulting pulmonary infection may closely resemble idiopathic disease of the lung, such as tuberculosis or bronchiectasis, both in local signs and general effects. 6. The therapeutic action of emetin and ipecacuanha is as striking in this as in the first condition described, and, as generally recognized, is more rapid and lasting than in amebic infections of the bowel. 7. Secondary infection of the respiratory tract with yeast fungi (monilia) may occur (socalled bronchomoniliasis). This appears to be of little diagnostic and possibly of no etiological importance.

Bed Isolation; Special Reference to Measles and Chickenpox.—E. H. R. Harries (*British Medical Journal,* March 6, 1924) concludes that bed isolation cannot replace small separate wards for the nursing of measles and chickenpox in their earliest phases; in their later and less infective phases the patients may be safely nursed under conditions of bed isolation. For short distances it is impossible to exclude the theory of aerial spread—possibly by bubbles in the case of measles. For distances of many feet human borne infection is much more probable. The later phases of measles and chickenpox can be successfully nursed with a wall space of nine feet for each bed. In the early stage a wall space of not less than twelve feet for each bed should be available. Protection by previous attack plays a part which always is important but which varies with different diseases and with the age distribution of the ward population.

Quartz Light and Vaccine Therapy in Pertussis.—King Grier Woodward (*Archives of Pediatrics,* August, 1924) employed the same technic in each of four cases of pertussis. The body was exposed to the quartz rays starting at twenty-six inches from the body with a three minute exposure. Each succeeding time the distance from the lamp to the body was shortened, and time of exposure lengthened, so that the skin showed a decided reddening for twenty-four to thirty-six hours after exposure. The vaccine used was stock pertussis glycerol vaccine, starting with 1,000 million Bacillus pertussis followed by two, four, six, eight thousand million. The time interval between the first three doses was three days, and five days between the third and fourth, and fourth and fifth doses. The earlier in the disease the case was treated the more rapid were the results. After each initial treatment there was decided improvement in the vomiting and the severity of the paroxysms. The subsequent treatments showed gradual improvement in all of the symptoms, which was especially noted within the first twenty-four hours after the exposure to the quartz light and administration of the vaccine. All signs of coughing ceased after the last treatment, which is very important in the author's opinion, as in the ordinary case of pertussis the patient has a slight cough which may persist for weeks or even months after the acute stages of the disease have subsided.

PEDIATRICS

Attempt to Vaccinate Children Against Tuberculosis.—Nathan Raw (*British Medical Journal,* July 19, 1924), treated 412 children, varying in age from 1.5 to 14 years, one of whose parents was suffering from pulmonary tuberculosis, with two prophylactic doses of a vaccine prepared from dead cultures of attenuated bovine bacilli. The injections were given at an interval of two weeks. No reactions were observed and in no case has there been any untoward symptom. However, a period of at least ten years must pe awaited before a final judgment can be given of its efficacy in all cases. The author is convinced that infection takes place most commonly in early life, and if we can with complete safety give some active immunity to those children who are directly exposed to infection at home, we will have taken a long step in the direction of prevention, which, after all, is the key to the problem.

Anesthesia for Short Operations on Children.—O. Stuart Thompson (*Lancet,* July 12, 1924), observed no bad effects from the administration of ethyl chloride in a series of ten thousand cases. He gives ethyl chloride on an open mask, the amount used being about three c.c. for a child five years old. It is sprayed on the mask, which is immediately applied over the face and is followed by open ether later on. The child is instructed to blow it away, and four "blows" with the inspirations that accompany them are usually sufficient to produce loss of consciousness. The child seldom struggles.

Oxidized Codliver Oil in the Therapy of Rickets.—Four cases of active rickets in infants, aged from five to twelve months, were treated by Richard Wagner and Hans Wimberger (*Lancet,* July 12, 1924), with oxidized codliver oil (heated for twenty-four hours at 120° C. with air bubbled through). The daily dose was ten grams and the cases, carefully controlled with regular x ray examination, showed satisfactory healing of the bone lesions at a rate rather slower than with the same dose of a potent, crude, untreated codliver oil. The growth promoting potency of the

two samples of oil, tested by growth experiments on rats, was found to be in the ratio of about 1 to 20. Assuming that a daily dose of ten grams of untreated codliver oil, when used in the therapy of rickets, does not provide any great excess of antirachitic principle, these observations lend support to the view that codliver oil contains two active organic factors: 1, antirachitic or calcium depositing, and 2, growth promoting (vitamine A), and that the latter is the more sensitive to oxidation at a high temperature.

Urticaria in Early Childhood.—Péhu (*Médecine*, August, 1924), notes that this disorder is much commoner in private practice than in the hospitals; gastroenteritis, especially with a tendency to athrepsia, is not attended with skin disturbances He recognizes three varieties of cases, as follows:

1. The urticaria is of alimentary origin and appears regularly, immediately or soon after the ingestion of such foods as milk, eggs or chocolate; some months or years later tolerance sets in and the eruption no longer occurs.

2. In these cases, which develop between the age of six and fifteen months, the urticaria appears at irregular intervals, without relation to any particular food, and lasts from a few days to three weeks in each attack. Moderate digestive disturbances, with loose, malodorous, whitish stools and constipation or diarrhea, may precede, accompany or follow the eruption. This variety may be regarded as of digestive origin, and rather often passes off at the end of the third or fourth year.

3. The third class of cases is characterized by the sudden appearance of the eruption, which is transitory and is unattended with any apparent digestive disturbance. Often this idiopathic variety, appears only at long intervals and causes the patient little inconvenience. Disorders of hepatic origin may precede, accompany or follow the urticaria of childhood, and are manifested in bilious vomiting, diarrhea, more or less colorless stools, or sometimes cyclic vomiting.

In the treatment of urticaria the author recommends ingestion of a mixture of twenty-five per cent. meat peptone, twenty-five grams; neutral glycerin, ten grams, and syrup of orange, enough to make one hundred and twenty-five mils. One teaspoonful of this is given by mouth one-half to one hour before each meal as long as the eruption persists, or indefinitely for prophylactic purposes in frequently recurring cases. Sometimes better results are obtained by using the special peptones from egg white or yolk or from the casein of milk. Results are not constant, however, and better effects may unexpectedly be obtained with the indifferent meat peptone than with the specific peptones for egg or milk cases. The exact reason for these individual discrepancies is as yet unknown.

Urobilin in Feces and Urine of the Newborn.—Lotte Goldschmidt-Schulhoff and A. Adler (*Zentralblatt für Gynakologie*, July 12, 1924), conclude that the excretion of urobilin in the newborn is independent of any existing or absent tissue icterus, but that it does speak in favor of a functional injury of the liver. Normally and physiologically urobilin is to be found neither in the urine nor in the feces, but the presence of pigment indicates a tendency toward icterus, to which only any factor causing an icterus is necessary and the nature and point of attack of which is still unknown. The same condition exists in regard to the bilirubin content of the blood and feces and to the biliary acid content of the urine. In this case there is also no relationship to the occurrence of an icterus. The important factor in icterus is not to be sought actually in the occurrence of the tissue icterus, which is only a symptom of the pathological condition, but rather in the metabolic conditions of the pigment in the organism of the newborn, any deviation of which from the normal indicates a disturbance in the activity of the liver cells. The liver alone should be considered as the site of origin of the urobilin in the newborn.

Facial Phenomenon in Children.—Stanley G. Graham and Grace H. Anderson (*Lancet*, June 28, 1924) found that 1,723 children between the ages of five and eighteen years, twenty-nine per cent. showed a positive facial phenomenon. A positive facial phenomenon in older children is not to be considered as evidence of latent tetany, because, a, there is no increased electrical excitability; b, no other sign of tetany and no history of previous tetany could be obtained in any of the cases; c, the sign varies from day to day; d, the calcium and phosphorus content of the serum were not found to be altered; e, the sign was found most frequently among a class of children in whom tetany rarely occurs; f, treatment with calcium chloride failed to produce a complete disappearance of the sign, as it does in cases of undoubted tetany. The fact that the sign occurred as frequently among healthy as among ailing children, and its common occurrence in the children brought up under the best social conditions, led the authors to attach little significance to its presence except as a possible indication of a neurotic disposition.

Meningeal Hemorrhages in the Newborn and Their Remote Consequences.—Alfred Gordon (*American Journal of Diseases of Children*, April, 1924) draws the following conclusions: The cause of meningeal hemorrhage is, principally, the tearing of the membranes due to their overstretching, which leads to rupture of the bloodvessels. To produce a tear, there must be great cranial stress. Since the latter is frequently the result of protracted, difficult labor, with instrumental delivery, the obstetrician should bear in mind that the force used in the application of forceps should not be excessive, or should not be applied to the wrong diameter of the head, as the anteroposterior diameter. Forceps are useful, but they may also be responsible for injuries in the fetus leading to consequences which have a direct bearing on the later physical and mental development of the child.

The preventive aspect lies in the consideration of all forces that are liable to lead to tearing of the meninges and the bloodvessels. Wrong presentation and position of the fetus and other causes of difficult labor, such as prolapse of the umbilical cord, the use of instruments or various manipulations in the delivery of the fetus, are all important factors of danger.

With a certain degree of possible errors, supratentorial hemorrhages, generally, present a somewhat different clinical picture from the infratentorial type. In the former, the blood spreads over the cerebral hemispheres; in the latter, over the cerebellar hemispheres and into the medulla. Consequently, in the former at birth, one finds a bulging fontanelle, and a group of nervous phenomena, such as insomnia and great restlessness and convulsive seizures, with a continuation of the condition. In the latter, there is considerable depression, apathy, somnolence, early cyanosis, vasomotor and respiratory manifestations and rigidity of the neck muscles.

Anatomically, in infratentorial cases lumbar puncture may be of considerable benefit. In the supratentorial cases lumbar puncture does not avail much. Surgical therapy is almost the only issue. Early craniotomy is directly indicated, and favorable results are to be expected only when the operation is performed within a few days after birth. In all cases indicating increased intracranial pressure at birth, lumbar puncture should be resorted to at once, before a definite localizing diagnosis is made.

Effect of Heat Treatment of Milk Feedings on the Mineral Metabolism of Infants.—Amy L. Daniels and Genevieve Stearns (*Journal of Biological Chemistry*, August, 1924), studied the mineral balance on boy babies varying in age from three to seven months, with the following results:

In certain instances babies who were holding their weight on given milk mixtures when pasteurized by the "hold" method, gained when the mixtures were quickly boiled, no other change being made. The calcium and phosphorus retention in infants fed quickly boiled milk mixtures was considerably greater than it was when the milk mixtures were pasteurized. The fecal calcium and phosphorus were greater during the period when pasteurized milk feedings were given, indicating that the longer heat treatment of milk results in a decrease in the availability of the phosphorus and calcium in the milk mixtures. There appears to be some relation between the calcium, phosphorus, and nitrogen retentions. It seems probable that the calcium needs of children are very largely determined by their skeletal development. In determining the calcium needs of normal children, it would seem more nearly fitting to include only those who are up to standard in weight, or to determine the calcium needs on the basis of the theoretical weight of the infants. It is probable that a baby fed pasteurized milk over a long period of time is not receiving a sufficient amount of calcium for his growth needs.

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Medicolegal Notes.

FOUNDATION FOR MEDICAL EXPERT'S OPINION

A medical witness in a personal injury case was asked if his experience had been sufficient for him to form an opinion as to the effect a concussion of the brain could have upon a man who had had an injury to the brain and thereafter suffered dizziness and loss of memory. To this question objection was made that "it lets the witness judge, and is not an opinion." The New Jersey Court of Errors and Appeals held, Stefanacci v. Borden's Farms Products Co., 125 Atl. 129, that the question was properly admitted. The court said: "Whether the witness qualified as an expert was of course a court question but the extent to which his knowledge may permit him to speak on matters within the purview of his science is a medical question on which he and those alike qualified could best express an opinion. It is a form of inquiry frequently met with in the trial of causes of this nature, and seeks to elicit from the witness the possibilities in the science itself or the extent of his own attainments in the science. There are bounds to medical knowledge, and it it not improper that we should ascertain those bounds from him whose training and experience qualify him to speak."

It was also held proper to admit the doctor's affirmative answer to the question if his reading and study entered into the opinion he had given. The court said: "It is by reading and study, as well as by experience, that the expert becomes such. To deny him the right to use these, when called as an expert witness, would be to frustrate the whole theory upon which the trained mind is admitted to express opinions in a court of justice."

EVIDENCE SHOWING THAT ACCIDENT WAS THE SUPERINDUCING CAUSE OF DEATH

In a proceeding for compensation for the death of a meter reader, it was held, Guyer vs. Equitable Gas Co., Pennsylvania Supreme Court, 123 Atl. 590, that the testimony of a customer of the gas company that deceased in the performance of his duty had entered her home looking pale and saying he had just slipped and hurt himself, pointing to his back, corroborated by the circumstances, including the fact that he subsequently suffered severe pain accompanied by frequent vomiting, which continued until his death, was sufficient to support the finding of an accident sustained in the course of the employment.

"The autopsy disclosed a diseased condition of the pancreas known as a cyst, which had been ruptured, as had also surrounding bloodvessels, resulting in the escape of large quantities of blood into the abdominal cavity. The family doctor was present at the autopsy and, as a witness, expressed the opinion that the fall had caused the rupture of bloodvessels, which, in turn, had caused the rupture of the cyst and death, and but for the accident Guyer might have lived for years, notwithstanding the diseased pancreas. Other doctors expressed the opinion that the rupture of the cyst, which all agreed was the immediate cause of death, was from natural causes wholly apart from the accident.

"The testimony of the family doctor was competent, and, if credited, which was for the referee and compensation Board, justified the finding that the accident was the superinducing cause of death; if so, the fact that the diseased condition of the pancreas might ultimately have caused death is no defense. There being legal evidence to support the findings, they cannot be disturbed either in the lower court or an appeal."

SUNSTROKE SUCH AS ANY ONE IS LIABLE TO NOT HELD AS ACCIDENT ARISING OUT OF EMPLOYMENT

Sunstroke or heat stroke has often been held to be an accident, both under the provisions of insurance policies and of Workmen's Compensation Acts; but sunstroke suffered by a log hauler while driving a team along a highway was held by the Indiana Appellate Court, Townsend & Freeman Co. v. Taggart, 142 N. E. 657, not to be an accident arising out of his employment, all travelers along the highway at that particular time being exposed to the same danger.

VALIDITY OF DYING DECLARATIONS

The Georgia Supreme Court, in a murder case, Benton vs. State, 122 S. E. 775, held that it is not necessary for the state, introducing in evidence dying declarations of the deceased, to show affirmatively that the deceased said he was in a dying condition in order to admit proof of his declarations, if in point of fact he was in articulo mortis, and the circumstances were such that he must have known that he was in a dying condition. Consciousness of his condition may be inferred from the nature of the wound and other circumstances. The fact that the statements of the deceased were made in response to questions asked him by another does not render such statements inadmissible. This fact may affect the weight to be given to the statements, but not their admissibility.

X RAY PHOTOGRAPHS OF THIRD PERSONS NOT ADMISSIBLE IN PERSONAL INJURY CASE

In a personal injury case the New Jersey Court of Errors and Appeals, Eggert v. Binder, 125 Atl. 106, held that it was proper to refuse the defendants offer to show x ray plates taken by a witness of other persons than the plaintiff, since they had nothing to do with the case on trial.

HEART DISEASE HELD NOT RESULT OF ACCIDENT

In proceedings for compensation for death from heart disease, occurring nineteen days after helping in the handling of large stones required in bridge construction work, one doctor testified that the overexertion caused the condition resulting in the death. Two other physicians said it "could" have been produced by the undue strain, but not that it "probably" resulted from this cause. The expert for the defendant gave evidence directly to the contrary. This raised a question of fact to be passed upon primarily by the referee and the Compensation Board subject to review by the common pleas. The dispute was decided adversely to the claimant, and the Pennsylvania Supreme Court held, Thomas v. State Workman's Insurance Fund, 124 Atl. 490, that the conclusion reached would not be set aside by that court, since it did not appear that relevant matters essential to a proper determination of the controversy had not been sufficiently inquired into. There being testimony showing weakened organic condition, which possibly might have been aggravated, the burden was on the claimant to show that the alleged accident was the probable cause of the death.

NO CAUSAL CONNECTION BETWEEN INJURY TO SIDE AND SUBSEQUENT PNEUMONIA

The Illinois Supreme Court holds, Perry County Coal Corp. v. Industrial Commission, 311 Ill., 206, 142 N. E. 453, that there was no causal connection between an injury to a mine employee by the right side of his chest coming into contact with a jack pipe, after which he continued at work about three weeks, and pneumonia resulting from a cold contracted while taking a bath, and he was not entitled to claim compensation.

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The Treatment of Fractures

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London

I propose to consider the changes that have taken place in the method of treatment of simple fractures since I started operating on them in 1894, a period of more than thirty years.

At that time the treatment of simple fractures was a disgrace to surgery. While that statement might be somewhat modified I believe that at the present time no branch of surgery is as unsatisfactory as this is and that a large proportion of the bad results of treatment are due in part to ignorance and in part to a want of skill on the part of those into whose hands they were unfortunate enough to fall.

The average student while in the wards sees only a small number of cases of fracture and he soon discovers that the views held, and the methods and the results of treatment adopted by his several surgical teachers, vary within wide limits. The excellent radiography done at the big London or other large general hospitals enables him, however, to recognize the character of the fractures, and he must form his own opinion on the relative advantages of the several methods of treatment which he sees adopted.

When he goes into practice he rarely has a case of fracture under his care and he soon realizes the anxiety and risk that its treatment involves him in. He may experience great trouble in the accurate diagnosis of a fracture since it is often impossible owing to difficulties of transport to obtain a radiogram in the case of fracture of the leg, and many of the radiographers and apparatus in country districts are not infrequently unable to produce perfect radiograms. A poor radiogram is often more misleading than none at all. The bad results of treatment both functional and esthetic are very obvious and as excellent radiograms can subsequently be easily obtained by the patient they may readily bring the medical attendant into a court of law, and may expose him to great financial loss and professional discredit. It is not generally recognized how many actions for damages are stopped by the tactful advice of the consultant or by a compromise of a financial nature.

The most important law I ever formulated is that *"the skeleton represents the crystallization of lines of force."* It is upon the knowledge of this law that the scientific treatment of fractures depends. The same law applies equally to every soft structure in the body and perhaps more effectually and obviously to the several portions of the gastrointestinal tract sufficiently to impose on the community about all the diseases of civilization.

Few surgeons appear to have sufficient mechanical knowledge and skill to deal effectually with fractures by operative procedures. As the risk of a possible unsuccessful result is so manifest it is very advisable that any medical man who is asked to treat a fracture should call another into consultation and he might with advantage choose an opponent. In this way he will materially safeguard his interests. In any case he should join a medical defence society when he starts in practice.

In operations on simple fractures the operator may experience great difficulty in bringing the fragments into accurate continuity, especially when two bones are involved, or when there is much comminution. Even when the fragments are placed in apposition, too short, a plate may be employed with an insufficient number of screws, or the plate may be placed in an unsuitable position, or the precautions taken may not be sufficient to ensure perfect asepsis.

It is no longer necessary to urge the wisdom of operating on simple fractures when the conditions which I put forward in my paper (1) in 1894 exist, the chief of which is the necessity for restoring perfect continuity of the fragments of a broken bone or bones by operation when it is of vital importance to the patient that the normal function of the skeleton has to be restored, assuming that it is not possible to obtain this result if other means have proved ineffectual. This applies to the long bones of the leg even more than it does to the rest of the skeleton since they have to transmit the weight of the body.

The somewhat abrupt change in the manner in which the operative treatment of simple fractures was regarded by the profession was due to the wise action of the British Medical Association on the initiative of Sir Victor Horsley, the then president of the Surgical Section, at the meeting of the British Medical Association in London in 1910, in appointing and generously financing a committee to investigate the result of the various methods of treatment and in printing their full report as a separate publication. It was entitled, The Report of the Committee on the Treatment of Simple Fractures. It contained a full and accurate description of the methods and results of the treatment of fractures in the several parts of the world.

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The committee comprised sixteen members who took part in the investigation on which they expended much time and trouble. The conclusions which they arrived at fully bore out the accuracy of my views. The committee was appointed in February, 1911, and the report was published in November, 1912.

This is, I believe, the only occasion on which the British Medical Association has taken such thorough and effectual measures to arrive at the truth in order to inform the medical profession on a subject which had long been discussed with so much violence and acrimony. The change in the attitude of surgeons to operative measures was at first followed by disastrous results, especially in America, where fractures were operated on by a large number of medical men whose experience and skill varied within wide limits. The failures that resulted from such indiscriminate operations were due to insufficient aseptic precautions as well as to lack of mechanical knowledge and of aseptic precautions. This brought about a reaction against operation, the procedure being held responsible and not the want of familiarity of the operators with the details necessary to insure successful results.

Many surgeons, hoping to obtain better results, attempted to improve on the simple methods which I employed, and which I have used with uninterrupted success since. They made more complicated steel plates or they used plates made of bone, they devised elaborate and intricate screws and screw drivers, drills, forceps for grasping the fragments and retaining them in apposition, and many other modifications, all of which rendered more difficult a procedure which in principle is perfectly simple, but which may be made most difficult and unnecessarily complex in its application.

The war produced a great change in the treatment of fractures by operation. Many of those surgeons who had been most actively opposed to operations on simple fractures did not hesitate to put plates and screws into the fragments of the broken bones in compound fractures usually produced by projectiles with the most disastrous results. It was quite a long time before the folly of this procedure was realized and a stop was put to this practice.

Even when the wound had healed or was apparently quiescent the introduction of such large foreign bodies as plates and screws not infrequently resulted in the renewed activity in the growth of septic organisms which had lain dormant in the bone and in the soft parts so that disaster followed such operative procedures only too frequently. It was a long time before this complication was recognized and dealt with, but finally the results obtained with suitable precautions were excellent.

With all this experience some surgeons still continue to secure the fragments of bone in recent compound fractures by means of plates and screws with the same most unfortunate results.

Every new procedure would appear to involve necessarily much damage and loss of life to the community, till the principles of the treatment and their application have been thoroughly grasped by surgeons generally. The use of steel screws has been objected to on the ground that they produce a rarefying osteitis, and that they have to be removed in consequence. This is due to imperfect asepsis and results only when the aseptic precautions employed by surgeons are insufficient. That this does not occur if enough care is taken is demonstrated by a large number of radiograms. It is perhaps not sufficiently recognized that the moderate degree of asepsis which is employed in operations generally throughout the body is quite inadequate for procedures involving the burying in the tissues of a quantity of metal. This only too readily affords a nidus and a medium for the growth of organisms, which do not exist in the wound in sufficient quantity to produce trouble without the presence of the foreign body.

Great advances were made during and since the war in the treatment of severe compound fractures of long bones especially, and much was done to improve methods of traction in simple fractures, by which the resistance offered to the apposition of fragments by the shortening up of the soft parts by hemorrhage and inflammation can be gradually overcome.

The most effectual method of treatment of simple fractures of the shafts of the long bones of the leg in which operative interference is not called for is by forcible extension usually under an anesthetic followed by the use of an ambulatory splint. The splint must be so constructed that while the fragments are being constantly extended the patient is able to lead an active life, moving the joints of the damaged limb with perfect freedom. In this way not only does the patient avoid stiffness of the joints and muscles which accompanies the ordinary methods of treatment but the formation of callus is hastened by the free circulation of blood through the limb. This splint can also be employed with great advantage after the fragments have been secured by means of plates and screws.

In the case of fractures of the shaft of the long bones of the leg this principle is carried out in an ideal manner by the extension apparatus devised by Mr. Hoefftcke with which you are probably familiar.

The principle involved of replacement of fragments by extension, the continued exercise of traction by some form of apparatus and the free spontaneous functioning of the muscles, soft parts and joints in the vicinity of the fracture, is that which governs the treatment of all simple and compound fractures. How often does one see a patient incapacitated for months and sometimes permanently by the limited range of movement of the joints in the vicinity of a fracture due to their having been left in one position for a long period. This complication is perhaps most serious in the case of a knee which has been allowed to become fixed in a flexed position.

In such cases of simple fracture in which the necessity for perfect function cannot be met because of inaccurate apposition of fragments operation is called for. In the case of malunion following compound fractures, only when the operator has every reason to suppose that the tissues have become freed from the presence of any organisms which existed in the original wound should surgical measures be undertaken with the object of restoring axial continuity of fragments. Such operations are often most difficult and may make a great demand on the knowledge, judgment and skill of the operator. This is particularly the case when both bones of the forearm or leg are involved. Grafts of bones should be used freely to fill up any gaps that may remain between the frag-

ments. Though it should be borne in mind that quite a considerable interval can be readily filled in by recrystallization of bone, along the line of force, great pains should be taken to secure them in position and immobilize them. The great advantage gained by the skilful employment of bone grafts is illustrated by the remarkable work which was done by Mr. Gillies and the other surgeons and dentists at the Queen's Hospital, Sidcup. The methods devised and adopted by those men form a new era in the treatment not only of the damage produced by projectiles but also of the various deformities and fractures of the bones of the face in civil life. The published works of Gillies and Pickerill contain full descriptions and illustrations of the various operative procedures requisite for these conditions.

REFERENCE

1. LANE: *Transactions of the Clinical Society* 1893-1894, a method of treating oblique fractures of the tibia and fibula more efficient than those in common use.

Splint Treatment of Fracture of the Neck of Femur and Hip Disease

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In the NEW YORK MEDICAL JOURNAL of November 22, 1919, a case was reported of unquestioned fracture of the neck of the femur in a woman of sixty-three years, treated by an abduction and traction splint from the first, without other fixation, with ambulatory treatment at an early date. The result was remarkable; the complete reestablishment of motion at the affected hip, without shortening or deformity, and the return to normal activity in six months. The case was shown before three medical societies, Suffolk and Norfolk South Districts of the Massachusetts Medical Society, and at the meeting of the American Medical Association in Boston, before the surgical section, where the definiteness of the cure was verified by physicians and surgical experts.

Other practitioners[1] have employed this method first adopted at the Massachusetts Hospital School and with satisfactory results. The following illustrative cases are reported:

CASE I.—Mrs. F., aged seventy-seven; gouty diathesis; extremely stout; wife of physician. The fracture occurred January 28, 1923; immediate extension, weights and pulley were employed. On the third day an x ray was taken and an abduction traction splint applied. On the fifteenth day there was no pain. During the fifth week a walking frame was used for she could not use crutches. The seventh week, a high sole, walking frame and bearing some weight. In eleven and one half weeks she was walking freely with the aid of a cane and without apparatus. The fourth month she was going up and down stairs without assistance and taking long automobile rides. The last condition showed no limp; no shortening; no limitation of motion. Symptoms, diagnosis and treatment were closely followed by seven physician friends of the family, five of whom were familiar with the use of the splint in other cases. (Figs. 1 and 2).

Fig. 1.—Case I.

Fig. 2.—Case I.

CASE II.—Mrs. N., aged fifty years. Date of fracture, March, 1918. Weight and pulley traction were used about three weeks, when the traction abduction splint was applied and the patient was allowed to move around freely in bed. She began to be up in her bedroom at the beginning of the fifth week from the date of fracture, and continued every day thereafter. She went down stairs at the beginning of the tenth week. The splint was removed three months after the injury. In the fifteenth week she discarded her crutches. (Figs. 3, 4, 5 and 6.)

The advantages of this method of treatment are evident. Not only is the patient relieved from the uncomfortable confinement of plaster of Paris fixation, but it may be believed that the freedom from plaster of Paris fixation aids in bone union. Before the introduction of plaster of Paris fixation, nonunion was little feared and bony union was to be expected with joint stiffness, some shortening and permanent disability. Since the use of plaster of Paris, however, nonunion is mentioned by several surgical authorities, with prolonged treatment by fixation, bone plating, insertion of a nail or other operative procedures, which are not infrequently unsuccessfully employed, inflicting permanent disability.

The plaster splint is known to cause muscular atrophy, unhealthy skin action, increased radiability of bone and presumably delayed bone formation. The splint ambulatory treatment here recom-

[1]References: Dr. John P. Gifford, Randolph, Vt.; Dr. Michael Barrett, Brockton, Mass.; Dr. Herbert E. Fernald, Cohasset, Mass.; Dr. William O. Faxon, Stoughton, Mass.; Dr. Walter A. Griffin, Sharon, Mass.; Dr. Roland Hammond, Providence, R. I.

Fig. 3.—Case II.

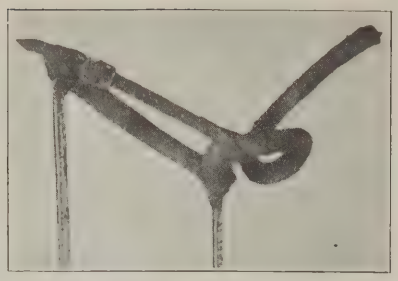

FIG. 9.—Ring opened in front and placed obliquely upon the rods.

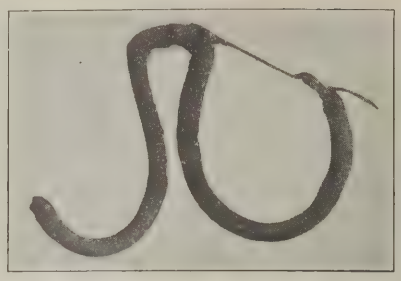

FIG. 10.—Perineal portion of splint from above.

Fig. 4.—Case II.

Fig. 6.—Case II.

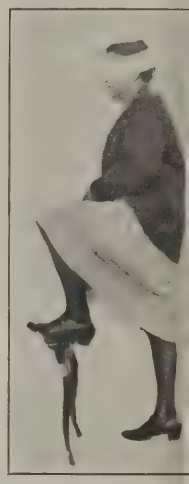

Fig. 5.—Case II.

FIG. 7.—Splint applied with high sole.

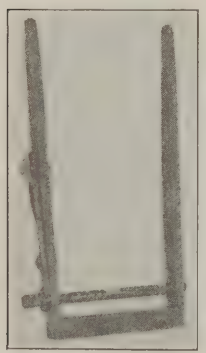

FIG. 11. — Showing ratchet attachment.

mended has the advantage of steadying the broken fragments, pulling them into their proper position and counteracting the pull of the adductor muscles. It gives sufficient fixation of the joint between the pelvis and the femur. It gives a minimum of constriction and resulting atrophy. It prevents the contraction of periarticular ligaments formed in the original accident, and allows gradual motion when it seems desirable to begin joint mobility.

This method of treatment was suggested for fracture of the neck of the femur by its satisfactory employment in cases of hip disease, where steadying the affected parts, counteraction of muscular spasm in the muscles around the hip, and protracted ambulatory treatment for a long period, are all desirable. Satisfactory results have been obtained in the treatment of many cases of hip disease by this method at the Massachusetts Hospital School, histories of which are recorded. (Fig. 7.)

The Massachusetts Hospital School is a state institution, primarily established as a school in 1908 for the care and education of crippled and deformed children who are physically unable to attend public day schools in competition with normal children. Soon after the opening of the school it became apparent that hospital facilities should be provided, and an infirmary department was established, which has now been in operation fourteen years. Of the 1,201 cases thus far received, there have been approximately two hundred cases of hip disease in various stages with deformity and partial cure, making ambulatory and fresh air treatment desirable. The cases most successfully treated were naturally those for whom the splint treatment had been begun at an early stage, and in whom bone ankylosis had not already been established. From these facts it would appear that mechanical treatment of hip joint lesions as here described can be confidently recommended to the profession.

Surgeons may be deterred from the use of the splint through unfamiliarity with mechanical aids. The splint itself, however, is a simple one, being a modification of the well known Thomas knee splint, which became familiarly known in the late war, but with the addition of adduction and traction adjustments. The splint (Fig. 8) consists of two steel rods longer than the affected limb, connected below by a flat bar forged out of the uprights or welded to them. The rods are attached above by a ring (Fig. 9) opened in front and obliquely placed upon the rods so as to fit the buttock from the tuber ischii to above the great trochanter. Attached to the ring near the top of the inner rod is welded a bent steel rod which passes above the symphysis pubis and under the perineum of the well side. This abduction arm (Fig. 10) should

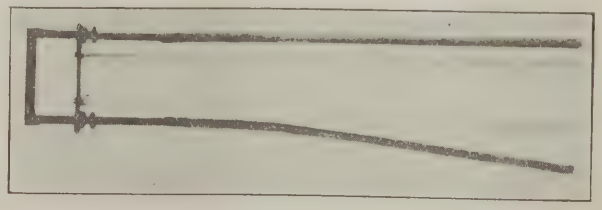

FIG. 12.—Movable transverse rod.

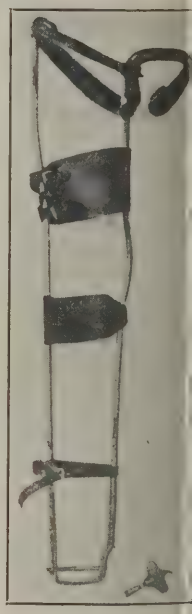

FIG. 8.—The splint

be long enough so that the end does not press into the buttock when the patient is seated. The upper rings are padded and covered with leather, and if properly shaped are not soiled by the feces or urine. Traction is furnished by means of adhesive plaster straps applied to the limb in the same way as for traction with weight and pulley. Just above the bar which joins the two uprights at the bottom, there is a windlass and ratchet attachment (Fig. 11) to which webbing straps attached to the adhesive plaster may be secured and by means of the windlass the necessary amount of traction obtained. The splint acts as a perineal crutch which can be adjusted to obtain as much abduction as may be desired. Circular straps of leather, canvas or convenient material may be employed to steady the limb. In place of the windlass and ratchet a simpler and cheaper traction attachment may be obtained by a movable transverse rod (Fig. 12) which may be adjusted and firmly fixed by means of nuts and threads at the lower end of the two upright rods. This apparatus requires less skill in application than is necessary in the use of plaster of Paris which is more cumbersome and confining to the patient, and offers less promise of a satisfactory result.

The Treatment That Gives Best End Results in Fractures About the Elbow Joint*

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The purpose of this paper is not a description in detail of the mechanics and the varieties of fractures of the elbow joint, but a discussion of the methods whereby the best end results are obtained. The elbow joint is more frequently injured in children than in adults and a study of development must be made to note the marked difference between the nature and extent of injuries in children and in adults. Before the twelfth year an x ray of a child's elbow will show the bony parts separate and distinct from one another: 1, shaft of humerus; 2, shaft of ulna; 3, shaft of radius; 4, ulna head; 5, capitulum; 6, trochlea; 7, olecranon; 8, external condyle; 9, internal condyle—a broken up joint without injury.

The difference, however, is not so great when we consider that the cartilage is as strong as the bone of the adult and the ligaments stronger; so that in an injury, the part giving way is the weakest—the bone in most cases. In the treatment the same method is used in children and adults, the end results being the same.

We agree with Ashhurst (1) and Neuhof (2) in comparing end results—"adding but one addition to their perfect result—"one in which the full and normal range of motion" and the presence of the normal carrying angle are the sequel of the treatment.

Fractures around the elbow joint can be classified, although anatomically not accurate, as suggested by Neuhof (2): 1, supracondylar (diacondylar); 2, internal condyle (including trochlea and epitrochlea); 3, external condyle (including capitulum); 4, head of radius, and 5, olecranon. The treatment in all, except the last, is best in the position of hyperflexion (extreme acute flexion). In considering the treatment, we must adopt that which will give us the best functional result and commensurate with the time required for immobilization of the same.

Supracondylar or diacondylar fractures are most frequent; about seventy-five per cent of all fractures around the elbow joint, and the description of the treatment of this will cover all other forms except olecranon. In supracondylar fractures we find a backward and upward displacement of the lower fragment. Here is where most men differ in treatment, whether by acute flexion, right angles or extension, in order to keep the fragments in position. This difference of opinion is due to the fact, as was pointed out by Lusk (3), that the fragments are not originally completely reduced. This can only be done by overextension, then suddenly flexing the elbow joint and keeping it in the hyperflexed position where the triceps will hold the fragments in alignment. Other authorities, as Keene (4), Scudder (5), Warbasse (6), Hitzrot (7), Gask and Wilson (8) and Speed (9) are undetermined as to the best method. It must, however, be admitted that occasionally a case will be met with in which in spite of overextension and acute flexion we find that the fragments are not in alignment, and only in the right angle position can they be kept in apposition. Radiographs should be taken before and after to see if the fragments are in proper position and to determine the best method of immobilization. If possible it may be best to replace the fragment directly under the fluoroscope.

Internal condyle.—This is the most disabling of all fractures around the elbow joint, on account of the loss of continuity of humerus and ulna and the loss of function of the arm. The most important element in this fracture is the pulling upward of the fragment and the loss of the carrying angle. In a position of acute flexion the broken internal condyle is kept in position by the weight of the forearm, and the ulna and triceps prevent its displacement backward. The fragments cannot be rotated when the flexors are relaxed.

External condyle.—The line of fracture usually takes in the joint. The disability, cubitus varus, is found in this fracture. If the parts are first placed in position of acute or hyperflexion, by which the external condyle is held in its normal position by the tense triceps, there is no tendency to this deformity.

* Read before Alumni Association of City Hospital, May 21, 1924.

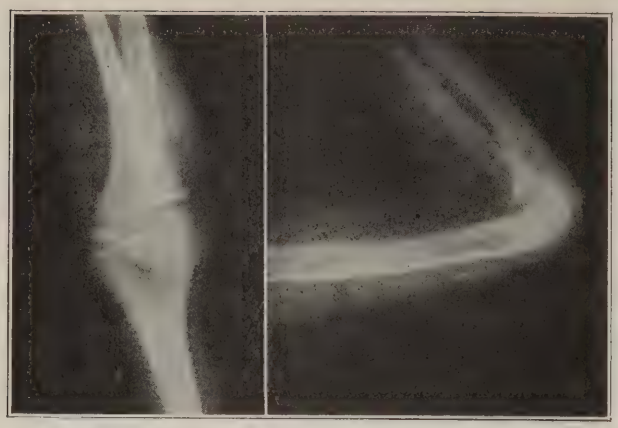

Fig. 1.—Case I.

If, however, an internal or anterior angular splint (Keen-Stimson), is used, it does not prevent the anterior and downward displacement of the external condyle. Complete extension is irksome to the patient; it tends to pull the condyle downward, and is difficult to maintain the carrying angle. Most authorities admit (Cotton, Scudder, Ashhurst, Da-

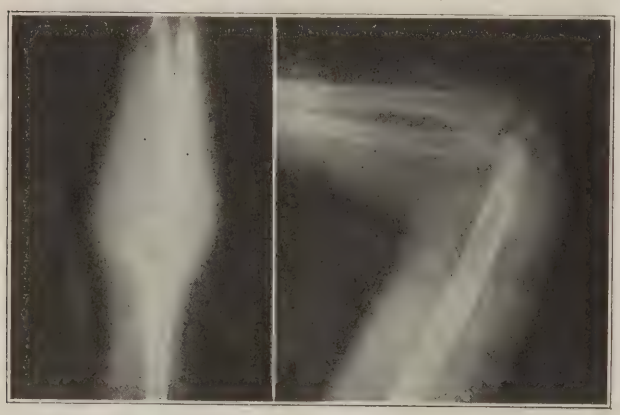

Fig. 2.—Case II.

Costa, Brewer and others) that the position of acute flexion or hyperflexion gives best results.

The most important points to be considered in any treatment are the retention of flexion, extension and the carrying angle. From a large collection of fractures around the elbow joint and sifting the end results, we have come to the conclusion that the

Fig. 3.—Case IV.

position of hyperflexion has given the best results.

The next question presenting itself is how long shall the elbow be kept in this position. Opinions are still divided. Most authorities agree with Jones (10), Speed (9), Ashhurst (1), Gask and Wilson (8), Warbasse (6), Hitzrot (73, Keene (4) and Scudder (5) in keeping the elbow immobilized for about three to four weeks. We have found, con-

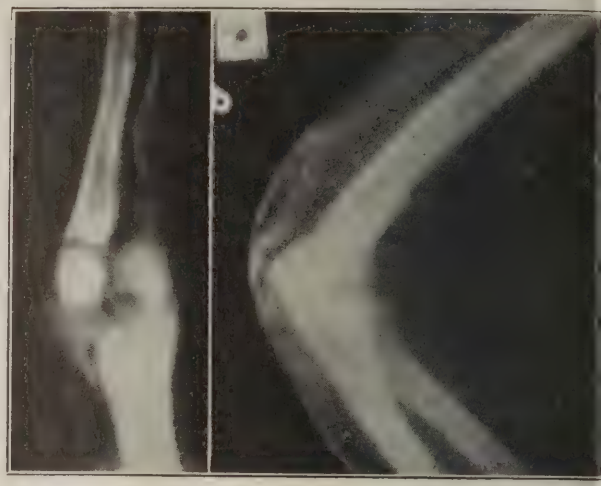

Fig. 4.—Case VII.

firming results of Neuhof and Wolf (2), that in most cases the best results are obtained by keeping the fragments immobilized for ten days to two weeks and thereafter gently, by massage and passive motion, to flex and extend the arm. After the third week if extension is not complete, help the same along by baking. The massage and passive motion must be gentle so long as the spasm of the muscles continues.

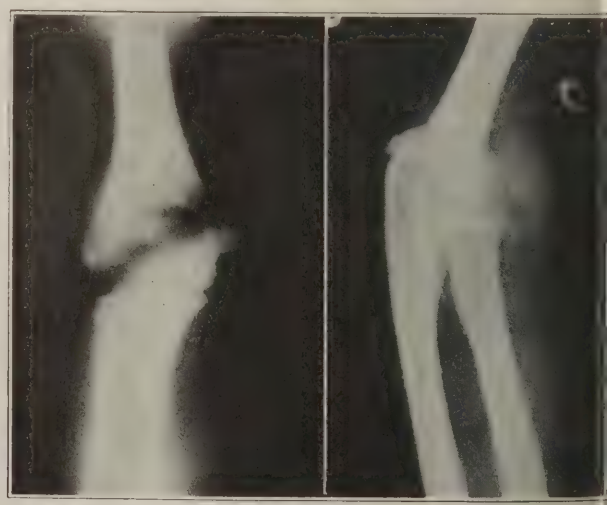

Fig. 5.—Case VIII.

Whether we use for immobilization plaster splints, as recommended by Hitzrot, or adhesive plaster, does not affect the result as long as the fragments are properly reduced by hyperextension and the elbow is in hyperflexion, care being taken not to compress the radial artery; and the forearm in supination with the wrist suspended from the neck. The

triceps act here as a natural splint, and whatever we use is only an additional support.

The end results, in my experience, bear no comparison to those treated by other methods. All my cases except one have been treated by acute flexion and the results have been uniformly a perfect result as far as functional use is concerned.

Olecranon fracture.—Extension has been found the best method of coaptating the broken fragments —and immobilization in this position. When, however, the elbow is included in the fracture we use acute flexion, and after ten days extension.

Fractures of the head of the radius, when fragments are in position, are treated the same as elbow fractures. Occasionally we find it impossible to replace the head of the radius, the head being rotated by flexion, and we may have to remove the head of the radius before a perfect result can be obtained.

The following are examples of some of the worst cases and the röntgenograms represent the position of the fractured parts when applying acute flexion:

Case I.—Patient R. B., fourteen years of age. Fig. 1, A, shows comminuted fracture of the lower end of humerus; B shows the arm put up in partial flexion and the fragments held in position.

Case II.—Patient S. G., eleven years of age. Fig. 2, A, shows diacondylar fracture; B shows arm in partial flexion.

Case IV.—Patient I. K., eleven years of age. Fig. 3, A, shows supracondylar fracture; B, acute flexion.

Case VII.—Patient W. S., eighteen years of age. Fig. 4 shows fracture of internal condyle, epicondyle and tip of olecranon.

Case VIII.—Patient M. U., twenty-two years of age. Fig. 5 shows fracture of internal condyle and tip of olecranon.

CONCLUSIONS

In all fractures around the elbow joint, except the olecranon, the most perfect results are obtained with the elbow in acute flexion (extreme) and a minimum immobilization period. Whether the patients are children or adults makes little difference in the results.

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Massage in Surgical Cases

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The effect of centripetal massage movements, the passes predominantly moving towards the heart, is to favor the passage of the lymph already in the lymph vessels toward the centre of the body, and to cause fluids lying in the lymph spaces to pass into the vessels. The good effect of this movement of fluids is recognized and unquestioned, and the art of massage owes much of its popularity to the acceptance of this principle.

But in surgical practice there is another need met by massage that is of equal importance—the need of resolving or removing fields or areas of deep, pronounced, sluggish and often painful infiltration in the connective tissue. Such boggy masses are of the utmost frequency of occurrence. Many times they form as the result of inflammations, just as they also follow injury. Only very young and vigorous persons throw off quickly the tendency of such masses to remain, assuming the character of chronicity. Their passing away depends on the maintenance and the heightening of the flow in the lymphatic vessels and the restoration of normal conditions in the cellular tissue. Men often speak of the patient's own physiological activities as adequate in emptying the lymph spaces and vessels. But I am confident that it is only in the case of young and vigorous persons that strictly unaided action gives us those prompt, full results that alone are of the highest value in restoring normality without scars.

Where these conditions are not supplied massage is of the greatest assistance. For it not only empties the vessels, but, properly administered, it also supplies to the cellular tissues and to the lymphatic vessels that gentle traumatism so greatly needed to rouse all the parts to resume an aggressive vital activity.

The skilled masseur, in practice, first reduces by centripetal movements the quantity of lymph in the tissues and the vessels; then he carefully proceeds to the treatment of indurations and infiltrations. And it is perhaps the most triumphant daily success of the masseur to break down and cause to disappear such deposits. If they are not thus caused to disappear the amount of scar tissue produced is eventually much increased, for connective tissue tends to grow into such deposits. And the induration and the contracture result in subsequent atrophy of the tissues. Even the bone becomes porotic, less stable and less resistant largely on account of diminished activity. It is well known that cicatricial tissue that has thus grown into tendon sheaths, aponeuroses and joint capsules or ligaments renders the affected tissues harder, stiffer, less supple and obedient to the will of the patient who so urgently needs mobility, flexibility and strength.

The practice of massage in fractures is of the utmost importance, and yet it seems to me its possibilities and practical uses are not recognized except

rarely. Immediately upon the setting of a fracture provision should be made for massage, if it is at all possible. For example, in all the cases of fractures of the lower extremity in which the chief reliance is light fixation or extension with some sort of splint, provision for massage should be made at the outset. This means that the field of the fracture should be kept easy of access and that the fixation of the parts by extension and by splints shall be adequate. All fractures are attended with some vascular rupture. Capillaries, veins, arterioles or even arteries may be torn. The extravasation of blood, evidenced by the clinical demonstration of fluid or much more frequently of coagulated blood, gives rise to socalled black and blue areas showing through the skin, to tight distention of the soft tissues with palpable masses of coagula and to shadows visible in the röntgenograms.

The reaction produced in response to the trauma adds an exaggerated quantity of lymph which still further distends the soft parts of the limb. Under these circumstances the use of massage is most desirable, the only exceptions being those cases in which immobilization may be compromised by the manipulations with possible displacement of fragments or where open wounds might become infected. Both these difficulties the skilled and eagerly interested surgeon almost always will be able to overcome. The masseur must be content for the first few days with modest progress in the removal of débris and with the appropriate necessary training of the tissues to tolerate the slight traumatism that is so urgently needed.

When the patient and his tissues are seasoned in this very simple manner very rapid improvement of the extremity is almost certain to occur. For the masseur makes a great effort to empty all vessels and cavities communicating with them. Naturally at the same time the fluid part of the extravasated blood is carried off, while the particulate, insoluble portion is largely taken up by phagocytes and carried off bodily. The observation of the process is interesting to the onlooker. The circumference of the limb, the tightness or tension of the tissues and the mass of palpable deposits are diminished rapidly, leaving the limb of much more normal appearance and resistance to palpation. The color of such a limb becomes much more satisfactory and the normal movement of the blood and lymph gratifyingly free. The edema disappears as part of the infiltration, and the tenderness of the extremity is almost wholly removed.

One cannot escape the conviction that the minute repair processes in the tissues about the damaged bone ends proceed under these conditions with greatly heightened swiftness and effectiveness. And the removal of dead tissues not needed but acting as foreign matter is of vital importance both as to the establishment of freedom from its mere presence and as to the maintenance of conditions that will prevent dense scar deposits.

In the case of a lower extremity which has suffered from some trauma and has been treated by attention merely to wound healing, the skilled masseur proceeds in a way most interesting to follow. His first three to five treatments are devoted to preliminary manipulations that are designed to stimulate the superficial structures and to accustom them to light traumatism. Rough manipulation at first may lead to the rupture of capillaries and to the heightening of irritability. Early attention is given chiefly to the skin and the subcutaneous tissues. The muscles and nerves are not so much regarded while the lymphatic vessels are given attention only as the hands pass over them in a general way.

But when serious manipulations can be tolerated as they may be after five to seven days, the deep lines of lymphatic vessels are broadly but heavily rubbed, especially strong pressure being made with the palmar surface of the thumbs.

These lymphatic vessels are felt by the manipulator as beaded cords usually running upwards from toes or fingers to the trunk, but the patient feels them as sore, tender, linear masses of denser tissue. The soreness aroused by pressure is such that a hardy person somewhat enjoys the feeling of pressure and the relief obtained by the manipulation despite the painful element. The infiltrated cellular tissue is simultaneously attacked; day by day the pressure upon both lymphatic cellular tissue and the lymphatic vessels is heightened until, if hardness and tenderness do not otherwise disappear, the masseur may apply the thumbs sufficiently heavily to make depressions in it, the tissue fluids being thus dispelled mechanically.

Here and there in the lymphatic vessels nodes of lymphoid tissue and well marked lymphatic glands are felt and, where no suppuration or pronounced disease is present, light massage upon them is beneficial. In fact after a week or two of daily treatment all these tender, infiltrated areas are made almost to disppear, with corresponding relief. My observation convinces me that the healing of broken bones under this process is more rapid than is otherwise the case and that there is much greater comfort, with speedier functional activity. The world owes Lucas-Championnière a great debt of gratitude for his insistence on massage in fractures.

Where lesions of the extremities have been somewhat neglected, after the more superficially located lymphatic apparatus has been given attention, the surgeon advises deeper manipulation, to do for the lower lying structures what has been done for those nearer the skin. It is surprising how the deep lymphatic spaces, vessels and glands come into prominence as seats of pain and tenderness after the more superficial difficulty is removed. The masseur continues his treatment actively until all tenderness and induration have disappeared.

Massage is needed for almost all wounds, surgical or otherwise, after their permanent closure is assured. The boggy, sodden or indurated tissues yield very quickly to manipulation if there has not been infection. The parts regain their normal feeling and function swiftly and the resulting scar is minimal in mass, being likely to be more pliable. Usually only a few treatments are needed.

After hernia operations and goitre resections the final result is reached much more satisfactorily and rapidly under massage.

It must be understood that the operator chosen to do the work of massaging must be adapted to the

work. Men are best for men; women for women, as a rule. And there are many unsatisfactory workers for one really useful one. It is worth while to seek out good workers, to encourage them and to give them professional support. The most satisfactory of my workers have been graduates of Stockholm and Copenhagen.

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Case of Pneumonia Simulating Acute Appendicitis and Followed by Bilateral Empyema with Complete Recovery

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In the perusal of literature pertaining to pneumonia and its sequelæ, one is struck by the infrequent mention of simultaneous empyema of both sides of the chest and by the rarity with which such patients recover. It is this, together with several interesting features of a differential diagnostic aspect, which has prompted the report of such a case.

Case.—R. T., aged eight. Family history: Suspected pulmonary tuberculosis in father's sister with rectal fistula and a bone sinus of the foot also probably tuberculous. Nephritis in two grandparents. Both parents were neurotic. Albuminuria in father. Mother had had glands supposedly tuberculous removed from the neck and had a large fibroid of the uterus, at time of patient's examination.

The patient had always been rather pale and delicate and subject to colds and sore throats. She had had several socalled bilious attacks in the past, usually accompanied by fever, vomiting and pain in the abdomen.

Four days before the present attack she was closely associated with a playmate in whom there soon developed an acute general respiratory infection of the influenzal type. The patient's present trouble began with a sore throat accompanied by fever but without a chill. Two days later she complained of pain in the abdomen and vomited. She had not coughed. The chief symptom was pain in the abdomen.

The patient was a frail girl of eight years. Extremely nervous but intelligent and anxious to help make a diagnosis. Her face was flushed; circumoral pallor was present. The alæ nasi were dilating with respirations. The tongue was coated. The tonsils were large and inflamed but without spots. The heart was negative. The lungs showed slight dullness over both bases posteriorly, the percussion notes for the right and left being about the same, but with no change in breath sounds and no râles, vocal fremitus was normal. The abdomen presented a rigidity of the whole right side with tenderness over the region of the appendix. The percussion note was tympanitic. Temperature 102°, pulse 95, respiration 35. There was a trace of albumen in the urine but no pus.

An ice bag over the appendix seemed to relieve the pain and the other symptoms abated somewhat under symptomatic treatment for several days when a few moist râles developed in the base of the right lung posteriorly. The percussion note was dull but compared equally with that of the other side. After consultation with Dr. Everett Gould of St. Luke's Hospital, the chest was explored with an aspirating needle and an ounce of thick green pus obtained which, on culture, proved to be a pneumococcus infection. She now began to cough, twelve days after the onset.

The patient was transferred to St. Luke's Hospital and operated upon by Dr. H. H. M. Lyle of that institution, who resected a rib and inserted a short rubber catheter. Although considerable pus drained away in the next two weeks and, although the right pleural cavity was explored through the wound for possible pocketing and the wound irrigated with Dakin solution, the temperature remained up and dyspnea and cyanosis increased. Blood count: total, 18,000, with 86 per cent. polymorphonuclear leucocytes. In view of these findings and in spite of an x ray which, in our opinion, showed no clear evidence of pus in the other side, I explored, under considerable difficulties, the left pleural cavity and obtained several ounces of green pus, also of pneumococcic origin. Although a local anesthetic was used, the patient made a considerable ordeal of this procedure and it was not thought advisable to repeat it. The evacuation of this small amount of pus gave some relief to the dyspnea, so she was allowed to go two days longer to further fix the adhesions on the right side. Under nitrous oxide a second operation was performed, an empyema button inserted and a collapsed Politzer bag attached as quickly as possible to partly reestablish negative pressure. Care was taken by means of adhesive plaster to render, at least temporarily, this drain air tight. Stormy convalescence followed, her chief symptom during this period being a constant desire to yawn. Wolff's blow bottles were used. Examined a year later, she showed no evidence of contractures or spinal curvature, and seemed in better health than before her experience.

An examination of this history emphasizes again what so many writers have promulgated, namely, the difficulty of making a differential diagnosis between acute appendicitis and an acute respiratory infection. Here was an apparent history of previous attacks, fever, vomiting, pain, rigidity and tenderness in the right iliac fossa, all of which pointed to the appendix as the offending organ. The lack of cough and the practical absence of physical signs in the chest also tended to confuse, the slight dullness posteriorly being extremely difficult to demonstrate because it was bilateral so that the percussion note compared equally with the other side.

On the other hand there were certain facts which, in spite of the apparent presence of appendicitis,

pointed to the possibility of respiratory involvement and rendered it advisable, if the patient's condition permitted, to treat expectantly for a few days. There was a history of exposure to an acute communicable respiratory infection, the first symptoms were in the respiratory tract—a sore throat, the face was flushed, the nostril dilated with breathing and the pulse rate was low for an abdominal condition while the respiratory rate was high. Behrend states that "the occurrence of appendicitis brings up the important difference between pneumonia and appendicitis. The closest observation and the finest diagnostic acumen are required to differentiate between them. Even before the symptoms of pneumonia are absolute, the one diagnostic point that has helped me more than any other is the respiratory rate, with the playing of the alæ of the nose and the bright flush on the cheeks. The child (because we are called upon to make this differentiation mainly in children) is not able to help the physician much to arrive at a conclusion. The mechanism which causes the inability to make a definite diagnosis at times is no doubt known to all of you. The last thoracic nerves send filaments over the abdominal wall, giving rise to referred pain in the right iliac fossa. The best advice that can be given is that the appendix should be removed under gas and oxygen whenever we are in doubt. Cases could be cited to illustrate this point, but it is satisfying to know that in the cases in which pneumonia developed due to an error in diagnosis, the patients recovered." As the progress of the case under discussion shows, any operation on the appendix after the above advice would have probably proved fatal.

Behrend further states that "It happens that in my experience more cases have been diagnosed pneumonia which were really appendicitis." On the other hand, Holt says, "The error usually made is to mistake pneumonia for some other disease, rather than to mistake some other disease for pneumonia."

It will be noted that the pneumonia never did reveal itself by frank physical signs except for a few moist râles and slight dullness and yet, from the course of the disease, a pneumonia undoubtedly preceded the empyema, and was the cause of her abdominal symptoms.

Recovery in this case in spite of the wide extent of the infection and the mechanical difficulties connected with breathing with both pleural cavities open at the same time, was, in my opinion, due to two factors. These were, first, the interval of two weeks allowed between operations which induced fairly firm adhesions to bind the right lung to the chest wall before the left side of the chest was opened, and second, the nonvirulent nature of the infecting organism. According to Rose and Carless more than half of the cases of empyema in children are due to the pneumococcus. The next most common organism is the streptococcus. Eggers reports two series of cases comparing the virulence of the streptococcus and pneumococcus in which he tends to show that while the mortality in streptococcus cases may vary from 5.6 per cent. to 62 per cent., the mortality from pneumococcus cases in his cases varied from 5.8 per cent. to 17 per cent.

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152 West 119th Street.

Ophthalmology and Stomatology*

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"It seems to me that the best and most hopeful feature of opthalmology is that it has relations, closer or more remote, with every branch of medicine and surgery. Indeed with almost every branch of science." This apothegm of Sir James Anderson may be supplemented by that of Sir Clifford Allbutt who said, "Diseases are not entities, nor even recurrent phases of independent events, but are partial aspects of a universal series."

With these postulates we may approach the problems of the ophthalmologist and the stomatologist with an open mind and with clarity of vision. In the first place what position does oral infection occupy in its aspect of this universal series? Is it a purely local disorder, a focus from which springs systemic infection, is it secondary to generalized or remote disturbance, or is it merely a symptom of a lowered bodily resistance? To my mind these four factors are coequal and cooperative. Does anyone believe that a pyorrhea is purely a local disease? If so, how is accounted for the gingivitis that may follow a luetic infection or be a sequel to latent gout with no joint involvement.

In the elaboration of my argument while consistency demands an adherence to my title and to specific instances of the relationship of eye to mouth diseases, yet the fact that diseases are not entities compels me to a broader concept and to a purview of the medical field. My old teacher used to say that neuralgia was a cry on the part of the body for healthy blood. It is presumably true but the cry becomes vocal when in addition there is localized irritation. I recall a case of the most violent unilateral neuralgia of the lower branches of the fifth nerve. So agonizing was this pain that the patient contemplated suicide. She had had all the paranasal sinuses exenterated with no relief. She had sound and beautiful teeth. She brought with her dental x ray films—rather lacking in definition—but sufficiently clear to rule out apical infections. Notwithstanding this I felt sure that the teeth were at fault. A röntgenogram showed three pulp stones on the affected side. Removal of these cured the neuralgia.

*Read before the American Stomatological Association.

Another source of reflex disturbance is impacted teeth causing orbital pain and neuralgia and to sensitive and decayed teeth have been attributed neuropathic keratitis.

A nice problem for decision comes up when a patient who needs operation involving the opening of the globe—iridectomy or cataract extraction—has a mouth full of rotten teeth. The time element is here the deciding factor. If it is an emergency operation leave the mouth alone. If not, extract the teeth, curette the sockets and put the mouth in the best possible condition. Then wait a week or two. In no instance must operation be done while the gums remain sore and swollen as they still harbor the infecting organisms.

It has been said that unerupted teeth are prima facie evidence of an infection in the matrix. I recall one case where an iritis promptly subsided when an unerupted canine tooth was discovered in an apparently edentulous jaw, and was operated upon.

There are those who believe that an infected root canal or an abscess at the apex of a tooth may be a primary lesion independent of the other factors I have mentioned. The following case might be considered confirmatory of this belief.

Case.—A young man working on a farm, apparently in perfect health, with no bad habits and with no history of previous illness or venereal infection, came with the statement that he could no longer see well in the right eye and that objects seemed distorted in outline. The clapboards on his house were no longer defined in straight lines but were wavy. Vision equalled only one tenth of the normal. Shortly before this he had come up before the Army examining board and this eye had normal vision. A painstaking analysis of every bodily organ and function revealed no abnormality. X ray examination of his teeth showed no apical infection but the test for vitality showed that the first bicuspid on the right upper jaw was devitalized. The ophthalmoscope of course showed no macular lesion as this particular type of disturbance of the retinal elements is microscopic and not visible to ordinary vision.

Frankly I doubted whether I had found the cause of his trouble, but nevertheless the tooth was extracted and in less than two weeks his vision returned to normal.

In every form of infection it is not the bacteria which do the mischief but the toxins which are elaborated in their life cycle and the dentine offers no more obstruction to their exit than would a coal sieve to a grain of sand.

Within the month I have had a striking demonstration of the connection between intraocular disturbance and oral sepsis. A young married woman, otherwise in good health, negative Wassermann and with negative cultures from accessible structures, presented herself with an active and progressive choroiditis. She had an artistic piece of hardware in her mouth, anchored to fixed crowns around the margins of which pus could be expressed. I advised that this denture be removed, that an autogenous vaccine be made and that she return for active immunization. I did not see her again for six months when she came again to my office. What prevented was a motor accident to her husband. She had followed my advice however and the upper jaw was now edentulous. Understand there was no other treatment whatever. To my great delight the process in the left eye had come to a complete standstill and her corrected vision was twenty thirtieths plus. In the right eye there were faint areas of depigmentation without the marginal coloration which marks a recessive process but her central vision is now twenty twentieths.

Every form of oral sepsis—pyorrhea, alveolar abscess, periapical infection, root infection and that around crowns and fillings—finds its analogue in ocular inflammations individualized in any of the ocular structures from conjunctiva to optic nerve, and more than this there may develop abscess of the orbit or thrombosis of the cavernous sinus.

Admitting for the sake of argument that all this is true, does it necessarily follow that any or all of these oral infections lead up to ocular inflammations? If so, then hardly a single individual would escape for under the artificial conditions of modern life few have perfectly sound teeth. The question of immunity, natural or acquired, now enters into the problem and here it is that the dentist needs the cooperation of the skilled clinician.

Specialism is of advantage only as it affords material for generalization and it is unfortunate that when one line of investigation be too closely followed that a loss of perspective results. The oculist is prone to dwell too intimately on local conditions and the dentist to see in the mouth only a field for exercise of his mechanical skill to conserve or replace damaged or missing teeth. Both the oculist and the dentist may overlook the fact that diseases of the eyes and mouth may not be diseases at all but be symptoms only or an end product of systemic disturbance. It is not enough to consider the teeth alone but the conditions in the buccal mucous membrane and the alveolar processes. An apical abscess does not necessarily mean infection from purely local causes nor may it be an impending menace to the bodily health; it may simply mean a lowered resistance and that the body is potentially or actually infected from other sources.

Here enters again the factor of associated infections and how these partial aspects of a universal series react to form a vicious circle. A pyorrheic involvement permits streams of pyogenic and pathogenic organisms to enter the intestinal tract and set up an intestinal toxemia which in turn reacts upon the mouth and makes futile any local treatment of diseased conditions there.

"A clean tooth never decays," is a forceful slogan for a tooth paste advertisement, but it is not true. A rachitic child might spend its entire time cleaning its teeth but that would not save the teeth from melting away unless the calcium metabolic balance were reestablished.

It is time that we get away from the rubber stamp diagnoses; diseases are not entities nor recurrent phases of independent events. We need the cooperation of the dentist and the doctor; we need the assistance of the laboratory but most of all we need the critical faculty which shall with prophetic instinct grasp the essentials of a disordered body in diseased conditions which are peculiar to itself.

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Syphilis of the Anus and Rectum

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(*Concluded from page* 205)

FACTORS INFLUENCING THE PROGNOSIS OF SYPHILIS

The diagnosis of syphilis based on the clinical aspects of the initial lesion cannot be made with absolute certainty. On the one hand, the supposed chancre might not be syphilitic and the patient therefore is subjected unnecessarily to the anguish and the hardship of a prolonged course of treatment.

Today, through our knowledge of the spirochete, with the aid of the dark field microscope, we are able in a few minutes to make a positive diagnosis of syphilis in every case of untreated chancre and to take the necessary measures to cut short the further systemic infection.

In all fluctuations of opinion as to the significance and value of the Wassermann reaction it is generally conceded that a strongly positive Wassermann reaction is found practically only in syphilis and that a strongly positive Wassermann reaction means syphilis.

Furthermore, the Wassermann reaction is used as an index of the efficacy of treatment and thus as a prognostic sign. On the theory that the Wassermann reaction is due to the presence of certain bodies in the blood that are produced as the effect of an interaction between the spirochetes and the tissues. The disappearance of the Wassermann bodies from the blood of the syphilitic, the occurrence of a negative Wassermann reaction, indicates, only the cessation of the interaction of tissues and spirochetes. It seems that a negative Wassermann reaction in a syphilitic means only that there are no foci of spirochetes in the patient sufficiently active to bring about the formation of an appreciable quantity of Wassermann bodies in the blood, but it affords no proof of the eradication of the spirochetes. We know that the late syphilitic with a gumma, in the skin, or with obvious symptoms of syphilis of the central nervous system, frequently presents a negative Wassermann reaction. We know, furthermore, that vigorous treatment in the secondary or the later stages commonly results in a negative Wassermann reaction which subsequently may become positive. As an index of the complete spirochetal disinfection of the patient, a negative Wassermann test at a given moment is relatively useless. On the contrary, however, as an index of failure to eradicate the spirochetes, a positive Wassermann reaction in the syphilitic under treatment has the greatest value and demands the continuance of treatment.

TREATMENT

In the early stage, before generalization has occurred, is the one psychological moment in the life history of syphilis when with one complete intensive course of treatment with mercury and arsphenamine we may expect a complete cure, but it must be begun immediately and pushed vigorously before the serological tests are positive.

Hoffmann asserts that a successful abortive cure of syphilis should be attained in from eighty to one hundred per cent. of all cases, provided the patient presents himself for treatment in the prepositive Wassermann period. Fabry states that it is generally admitted now that in primary lues sterilization is obtained prior to the positive Wassermann period in one hundred per cent. of all cases. Galewsky says that in all cases of early syphilis showing a positive dark field and negative Wassermann they continued to show a negative Wassermann throughout their treatment with silver salvarsan and during one year of observation following this.

TECHNIC, PRIMARY STAGE

In 1916 Pollitzer (9) outlined a method he had employed successfully and apparently without danger, of using three injections of arsphenamine, each consisting of 0.1 gm. for from twenty-five to thirty pounds body weight, on successive days, following this with eight weekly injections of two and a half grains each of mercuric salicylate. Three series in a year were employed, with a test period of two months between the series. This method was founded on the scientific theory of fractional sterilization as employed in the laboratory. The principle is alluring as it includes a concentrated attack on the microorganisms in such a manner that their development between treatments is not possible to any degree. From clinical experience it is evident that a single injection of a size compatible with safety cannot destroy all of the spirochetes present; and when the interval is prolonged between injections, the remaining microorganisms reproduce so that it is possible that almost if not quite, as many are present at the second injection as at the first, so that other factors would necessarily have to intervene before the infection is overcome. In this method it is supposed that at the first injection the major portion of the microorganisms are destroyed; and as the second injection follows so soon, many of those remaining are overcome and a few that escape this are reached with the third. That this is not literally true is evident, but the fact remains that many patients thus treated early do not show further signs of the disease. The possible dangers attending this method were discussed by many, but most observers agree that if it were safe it offered possibilities more promising than other methods.

A Wassermann blood test is recommended after each course and a spinal fluid examination after the second course. During the second year of the disease perform a Wassermann blood test every three months and lumbar puncture with a complete serological examination of the spinal fluid. If at any time the Wassermann becomes positive treatment will be renewed. If at the end of the twenty-fourth month the Wassermann blood test and spinal fluid are negative the case is considered cured.

A Wassermann examination should be made dur

ing the rest period after each course of treatments and if constantly found negative during the year two series of treatments should be given as a prophylactic measure. In the Wassermann positive cases the procedure is a continuation of that outlined for the first year.

In all patients presenting themselves with a positive Wassermann the arsphenamine injections should be six to a course and the courses of mercury should be from ten to twelve injections at weekly intervals of gray oil or mercuric salicylate. Serological tests should be made after each course until several negative results are obtained. From then serological tests should be made at two month intervals, until the test seems to become permanently negative as shown by at least five unbroken negatvie tests, each six months apart, with no treatment and no clinical evidence of syphilis before we should become in the least optimistic in regard to the case as being checked or cured.

The third year, if the Wassermann test remains negative and there have been no recurrences from the first year, a patient should pass into a period of observation with regular periods for a serological examination.

Several methods of administering arsphenamine have been developed:

1. The intravenous method may be called the universal one, because it is so universally employed. The drug enters the blood stream, and therefore this method exerts a strong appeal to those who favor direct action against the parasite invader in the blood current.

Technic.—The water is distilled the day previous to its use. The distilled water is boiled on the day of the administration of the arsphenamine. The water used is at room temperature. The arsphenamine ampoules are immersed in ninety-five per cent. alcohol; twenty c. c. of the sterilized distilled water is placed in a sixty c. c. medicine glass and the contents of the ampoule containing the arsphenamine are dropped into the glass containing the distilled water. The arsphenamine powder floats around on the surface of the water until it is completely dissolved, which takes approximately one minute. The contents of the medicine glass are now drawn up into a thirty c. c. Luer syringe. Just prior to the insertion of the needle the operator dries same with a piece of sterile gauze in order to prevent the solution from coming into contact with the tissues. After the needle is introduced into the vein enough blood is withdrawn to fill the syringe. By this means we are positive of the needle being in the lumen of the vein, and according to Kolle (10) the toxicity of arsphenamine is immediately reduced by the addition of albumin or serum. The injection of the solution is made slowly, requiring approximately one minute. The needle is withdrawn quickly and the operator raises the patient's arm and uses marked pressure at the site of the injection in order to prevent extravasation of the fluid back into the tissues.

Intrarectal is by far the simplest and least annoying to the patient, but probably not as effective as the intravenous method. In patients whose veins cannot readily be utilized for direct injection into the circulation a larger dose per rectum may be given.

The technic is simple. On the day preceding the injection the patient takes a saline cathartic and two hours preceding the injection a rectal enema is given; no food is permitted for six hours preceding treatment. Paregoric given at the time of injection helps to tighten the bowel, and the fluid then can be retained eighteen to twenty-four hours.

Technic.—The patient is placed on the table or bed in the genupectoral position and a catheter is introduced into the rectum for a distance of six inches. The method of preparation of solution is as follows:

Dissolve 0.6 gm. of arsphenamine in distilled water and add normal saline solution to make thirty c. c. Alkalinize this, making the monosodium rather than the disodium salt. This means that merely enough fifteen per cent. sodium hydroxide solution to clear the solution is employed. This is in contradistinction to the procedure in administering the drug intravenously when the disodium salt is essential.

By means of a funnel attached to the catheter or to the barrel of a Luer syringe the arsphenamine solution is allowed to pass in slowly. Upon the withdrawal of the catheter, the patient is kept in the genupectoral position as long as possible and is then allowed to assume and remain in the Sims position for a time. If the injection is given at home, the favorite time for administration is at night, so that the patient can remain in bed.

As will be noted, doses of 0.6 gram arsphenamine are recommended when the rectal route is made the channel of treatment. Some clinicians report that 0.8 gram can be safely and profitably employed, rectally.

Henry G. Marthens recommends massive doses giving as high as four gms. at an injection.

From a series of 125 cases he concluded that neoarsphenamine can be administered safely in four gm. doses; that arsenic is absorbed into the blood after these injections, and larger quantities are eliminated in the urine than after ordinary intravenous injections; that arsenic persists longer in the blood in perceptible quantities after the rectal method with large doses than after intravenous injections; finally that the rectal administration of massive doses, especially in the case of children, has a decided place in therapy, in cases in which the intravenous method cannot be used.

Mercurial administration.—Supplementing the arsenical preparations mercury should be given to our patient and the most efficient treatment is the intramuscular injection of gray oil (oleum cinereum) or the salicylate.

The insoluble salts of mercury are preferable to the soluble salts because their effect is more continuous and the injections need not be given as frequently. The injections should be given once a week deep into the gluteal muscles, although any region in which there is a thick mass of muscles may be used. The injection should be made directly and deeply into the muscles, with the strict observance of asepsis. In infantile syphilis treatment by inunction is much to be preferred to all other methods. One dram of equal parts of mercurial ointment and lanolin should be spread upon the abdominal binder daily.

TREATMENT OF TERTIARY MANIFESTATIONS

The treatment of tertiary syphilis of the anus and rectum require the systemic treatment outlined

above to which should be added full doses of potassium iodide, preferably given in milk or essence of pepsin, the dose being built up to sixty to one hundred grains daily in small frequently repeated doses.

The patient should be put to bed and the bowel relieved of all irritating material which might excite the colon or pelvic bowel. Every effort must be made to prevent septic infection. The bowels should be emptied regularly and the rectum irrigated twice daily with some bland antiseptic, followed by the injection of six ounces of one per cent. iodoform or ichthyol emulsified in olive oil, this latter to be retained. Individual ulcers may be cauterized with silver nitrate, thirty to sixty grains to the ounce and repeating the application every two or three days. The sphincters should be dilated to assist drainage.

Ulcerating gumma may be hastened toward recovery by applying daily or every other day, a piece of mercurial plaster or an ointment of calomel, one dram to the ounce. This makes a convenient, cleanly, and effective treatment.

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Vascular Disturbances

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(*Concluded from page* 236)

1. Nitrogen partitions as now determined offer little of value outside of an index of the renal excretory function. Chemical imbalances from split protein products lie in factors at a level higher than those now determined in blood chemistry. Studies in amino acids, especially if we go so far as to differentiate the active amino acids, promise to be of as much benefit as the determination of the fatty acids have proven in diabetes. Certain diseases suggestive of hepatic deficiency show a urine urea (blood urea normal) as low as twenty per cent. returning to high levels on a water diet and augmented by salicylates. This rise is associated with marked clinical improvements.

2. Sugar curves in relation to sugar or carbohydrate intake promise aid in determining hepatic (glycogenetic) deficiency, as noted above.

3. The significance of alkali reserve has been badly clouded by an attempt to make hydrogen ion concentration a chemical complex with an associated symptom complex. As a matter of fact, a symptom complex (such as described by Henderson—dyspneas, etc.) occurs only in extreme loss of alkalies, a loss so pronounced as to interfere with the gaseous exchange at the capillaries. Outside of this there is no direct relation between symptoms encountered and the degree of hydrogen ion concentration. The acidosis of diabetes (deficiency of isles of Langerhans, fatty acids) provokes less reactivity of bloodvessels than does the acidosis we have encountered whose origin and associated chemistry suggest hepatic deficiency (amino acids) wherein a marked vascular reaction is registered. The determining factors are not the concentration of hydrogen-ions but the character of the acid substances and adventitious products associated with perverted metabolism as well as disturbances in proportions of the blood ash. Calcium deficiencies are associated with nutritive disturbances (leg ulcerations) and disturbance of alkali proportions (in serum) provokes erratic muscular contraction (Ringer). Furthermore, chemical distortions (pancreatic diabetic and perhaps hepatic) seem to lower immunity (skin and respiratory respectively). Acidosis arises from various factors. The ultimate end of carbohydrates and fats is carbonic acid which binds the alkali only while in transport to the lungs at which point it frees them. Its precursors, carboxyl acids, carry them out through the kidneys. The ultimate end of protein acid derivatives is amidocarbamate (urea). Its procursor amino acids, likewise encroach on the alkali reserve. The most that can be claimed for alkali reserve which enters into so many complex chemical activities, is that it is a reliable barometer of distorted or arrested metabolism the nature of which requires further chemical study or interpretation by symptomatology (complexes and causative factors). These principles will explain the disappointments in forced alkali feedings which restore alkalies to high level without proportionate improvements in symptoms as comparable with a therapy that overcomes the primary cause. This can be nicely demonstrated in cases of acidosis from intestinal fermentation.

The crucial test of merit in any medical effort must eventually lie in what it offers for relief of suffering and disease. The foregoing discussion is founded on four hypotheses: a, reactivity of smooth muscle into chemical changes making the vessels a barometer of chemical imbalances; b, where chemical determinations are not definite enough in themselves to demonstrate the nature of the morbid condition (interpreted in connection with causation fac

tors and symptomatic reactions) they are still of no little value; c, a factor in intestinal fermentaion, frequent and dominating, are the anaerobes and raising the oxygen tension of the colon will result in decrease in intestinal fermentation, improvement in symptoms, and restoration of chemical balance. This is only one solution to the many complexities involved in chemical imbalances and chemical diagnosis; d, that degeneration of intestinal epithelium by fermentation (or focalized infection) is an important, if not the essential factor in determining the damage done by such fermentation (of infection) and that the restitution of such epithelial patches as above described should be the target for therapy in cases primarily due to fermentation. Abrogating these principles from consideration when confronted with such medical problems as are the basis of this work we are left where the textbooks leave us in discussing such subjects as neurasthenia. True we are admonished to look for larval hyperthyroidism or syphilis. Psychoanalysis is recommended and we are instructed to "build up patients," by which is generally interpreted forced feeding. Thus our cited cases show x ray burns in the thyroid region in spite of negative reports from indirect calorimetry. Many sufferers have their anxieties magnified by a syphilophobia without foundation. Some whose metabolic capacity is already impaired suffer further damage by forced feeding. All these errors would not be committed if a chemical report were part of these case histories. Even if such a report is not conclusive, one can remodel the mode of living along more rational lines with a chemical insight even though minute. Furthermore, a chemical determination will stay the hand of useless surgery. The choice of therapy lies in the field of casual relations. The present state of medical progress requires that we stress almost to the point on ignoring any other factor, those causes discussed under exogenous. Both for brevity's sake and because of its importance and clarity we will discuss chiefly the handling of cases whose chemical balance is thrown away through the activity of intestinal bacteria.

The intestinal flora is sensitive to dietary changes. Our present knowledge of intestinal fermentation stresses the importance of the carbohydrate factor, especially certain types, sugar, patent wheat flour and starchy tubers (potatoes). A substitution of green vegetables, whole grain, berries and especially fruits is imperative. We have seen most remarkable recovery from infant acidosis by fruit sugar (hypodermoclysis). Equally striking are the results following change to proteins (caseinates), fruit juices and appropriate vegetables. Air is also a diet for bacteria at least, and rise in oxygen tension is frequently followed by gratifying results. This rise is obtained by giving peroxides of alkalis and by enema containing Dakin chlorine compounds (see below).

Vessel muscle fibres are subject to nerve impulses and emotions. A highly trained pitcher's arm will suddenly develop transient or prolonged instability during the strain of pitching. The strain on these smooth muscle fibres during emotional storms is no less than a pitcher's arm is subject to. In fact there is unquestionably a vascular instability (some cases of socalled shell shock) resulting from violent emotions (fear). Chemical determinations should prohibit confusion with this instability on a chemical basis. Sleep is the great restorer of muscle and an unstable vascular system, either from emotions or chemical distortions, regains its stability by regular sleep as much as by any other method. Regularity in habits is indispensable.

Exercises register both beneficial and detrimental effects. When detrimental the case falls in a group of low alkali reserve. Exercise then provokes a fatigue that persists together with palpitation and mild dyspnea. This paradox is explained by the complementary relations between muscle fibre and liver cell. The former catabolizes sugar as against the liver's anabolism (glycogenesis) and thus lessens the liver's load, while muscle activity piles up the work of the liver in increasing amino acids. In the type described above, hydrotherapy and massage are desirable substitutes until conditions improve and the reserve alkali increases.

Rational medication lies in management of oxygen tension and the restitution of epithelial intestinal lining. Peroxides are given with benefit. The metal chosen depends on conditions. Due to the associated hyperperistalsis bismuth is indicated but the technical difficulties in preparing a bismuth peroxide are as yet unsurmounted. Magnesium peroxides is beneficial and seems to lack the flare back of other magnesium salts. The magnesium ion alone is valuable as a stimulant to bile flow. Its exhibition alone will sometimes effect a marked change in the chemical picture. The patchy adherence noted suggests the use of an oil with high viscosity (petroleum oils). Clinically we obtain better results when a suspension of bile is incorporated. Whether this adds to its physical properties as a lubricant or whether bile salts exert a stimulant effect on the intestinal epithelium is not known. We know that Dakin's solution vitalizes cells and it also raises oxygen tension. Dichloramine-T is miscible with liquid petroleum if first dissolved in about four times its weight of methyl salicylate concentrations up to four per cent. (two per cent. is generally strong enough) and apparently show no interreaction between chlorine and oil. They should be prepared fresh every few days. Given by Murphy drip the scope of their activity is increased. We have instances wherein the symptoms and chemical changes were totally controlled by such enemata. A combination of peroxides and such enematas seems to be effective in a large percentage of cases of intestinal fermentation.

One cannot master problems in the sick room and fail to gain a knowledge of drugs that impels their use without rational basis. Such is the case in vascular disturbances. In migraine we learned from the Rush Medical Neurological Clinic the use of bromides and from the University of Basle the use of salicylates. A Hungarian observer (reference lost) demonstrated the disappearance of indican through giving hexamethylamine. This empyrical combination affords relief at times particularly from migraine. Patients who refuse any medicament but morphine can be persuaded to take their "shot" intravenously and this combination be given without their knowledge. The substitution of feeling of well being for a morphine flare back they attribute to the mode of administration and in many instances this method has led to breaking this dependability on

morphine. These cases have afforded means for studying chemical effects of these drugs and a remarkable restitution (only temporary) in chemical balances has been found in several cases. Peruvian bark is a time honored remedy which fell into disuse when quinine was introduced. Recently it has come into its own in the form of a quinoline base, cinchonic acid. This combined with a phenolic base makes what promises to be a better substitute for salicylates. We should not frown too much on drugs. We have been giving kalium iodide for centuries as a drug. Now we find it an indispensable factor in sustaining health condition and we are now making it an essential part of our drinking water. At least in this field of chemical diagnosis we are doubly fortified in our choice of drugs; both symptomatology and therapy are susceptible to control by chemistry.

SUMMARY

Our prime object is not to describe a disease entity nor even a symptom complex. We are confronted by the problem of staving off deteriorations in stamina and in coping with this problem we have observed certain phenomena and the therapy that these phenomena have suggested has proven beneficial. Our position is comparable to that of a woodsman whose woodcraft gives him certain signs (as the northerly location of tree moss) by which he directs himself without deviation to his objective. We believe that further studies will add to such signs and bring the clinician to his objective with increasing directness.

What we present here are: a, certain clinical findings will come to us either in the presenting symptom or those deduced in the history and examination which will be indicative of vascular disturbance; b, once determined a causative factor should be determined in which we stress activity of intestinal flora; c, the reactivity of bloodvessels in primafacie evidence of chemical imbalance and a careful chemical analysis should follow, which must be interpreted in the light of symptoms present and causative factors; d, this will lead to a more rational therapy the results of which should be attended with further chemical analysis to establish a further parallelism between the clinical and chemical.

CASE HISTORIES

Unfortunately many histories of value are not available. King has recorded similar observations on rabbits.

CASE I.—(A. J.) Presenting symptoms, malaise, asthenia, insomnia, nervousness. Previous history: A stay at a State hospital following a nervous breakdown. At high school the physical examination was negative except for tenderness along the liver border. Treatment: Restricted starches, medication, cinchonic acid derivatives and salines. Blood chemistry: Alkali reserve 40, ten days later 58.

CASE II.—(R. L.) Complaint: Seen in hysterical attack brought on by overwork. There had been an obstinate constipation and the diet was excessively starchy in nature. The physical examination was negative except for flatulency. Sedatives, cinchonic acid, chlorine oil enemata were given. Alkali reserve after abatement of nervous symptoms 47, after five days enemata 58.

CASE III.—(M. M. J.) Asthenia, unsteadiness developing into auto driving, flatulency. The patient had been advised an operation on the gallbladder. Heavy white bread, cake and potato eater. Examination showed flatulency, liver border tender, but not localized. Salines with chlorine enemata were given, fruit and green vegetable diet emphasized the blood chemistry; alkali reserve 45, nine days later 56. Improved.

CASE IV.—(M. McL.) Complaint, periodical headache, chronic constipation, nervousness, inaccuracy in work. The physical examination was excellent. A good boxer. The treatment consisted of oil enemata (chlorinated). Blood chemistry, alkali reserve 50, no headaches during treatment. One week later much improved, alkali reserve 60. Sugar (seven hour fast) 75, creatinin 1.5. Seen again during attack of headache, alkali reserve 38 (very nervous). Two days later 55. Treatment, magnesium peroxide and chlorine enemata.

CASE V.—(M. M.) Complaint, malaise, easily fatigued on exertion. Dysuria nervous attacks. History showed an attack of influenza leaving patient with alternate diarrhea and constipation with acrid stools. Treatment, restricted starches, chlorine enemata, mercurochrome for pyelitis (intravenously). Blood chemistry, alkali reserve 50, ten days later 68. Diarrheal attacks ceased. This patient probably has an endocrine imbalance.

COMMENT

1. All pathological changes are not limited to the median coat, but sudden changes which involve it are the first and foremost to manifest themselves clinically. So in other fields (etiology, pathogenesis) such phenomena as are the soonest and most clearly registered in clinical procedure are those that are stressed. We aim to use these phenomena as stepping stones to further clinical success.

2. Heightened chemical activity is a phenomenon not limited to the hormones but is registered with less complex organic products and with simple inorganic ions (Ringer's alkalies).

3. One can not progress far in the study of chemical imbalances without running into conditions which register endocrine deficiency. Nor will material progress be made in medical chemistry until the medical aspect of these endocrine hormones is understood. One endocrine function (ovarian) because of its cyclic nature (menstrual cycle, pregnancy cycle, etc.) lend itself to ready detection. We cite certain case histories which show its relation to chemical imbalances and vascular disturbances. We avoid a discussion until the simpler phases of this problem are better understood.

4. No greater blow could be struck this most promising science than to destroy the interdependability between it and clinical findings. The laboratory is as yet no place to make an isolated chemical diagnosis.

5. Reference is here made to the studies of Cannon, Carlson and others on the dynamic (muscle) phenomena observes in the alimentary musculature and their relations to the alimentary sensations of appetite, hunger and pain. These five smooth muscle systems afford a wealth of knowledge and a most promising field for study in muscle dynamics when

the muscle phenomena of each system are correlated and compared. Thus each has its tonal status, each is the seat of colics (known by different name) and each has its asthematic attacks. Mucous colitis is so accredited and we are meeting with distortions of urethral contractions asthmatic in character associated with chemical imbalances and frequently concurrent with mucous colitis. In some cases this combination of attacks seems to be increased under pituitrin. We had some time ago a case of asthma (following thyroidectomy for pressure dyspnea) concurrent with a period of amenorrhea. The bronchial tubes were hypersusceptible to dampness which provoked asthmatic seizures. This hypersensibility receded with the return of menses (restoration of endocrine balance). Unfortunately we did not appreciate the value of chemical studies at that time. So much of what we call symptoms are concerned with involvement of muscle dynamics, so much of therapy undertakes the rectification of the same that it is surprising that so little is said and known of muscle behavior. In passing it may be of service to note how promptly some of the cases of combined colitis and dysuria are relieved by hot retained alkali enemata.

6. Advanced cases suffer from attacks resembling angina. The conditions requisite for an electrocardiogram mitigate against the occurrence of vasomotor spasms. We have been unable to obtain a record of the heart during an attack.

7. Superimposed psychoses are an admitted sequela of prolonged and severe migraine.

8. It is our purpose to publish a description of apparatus and methods that will much simplify the cost and effort in gas analysis.

9. Determinations in amino acids have so far brought no conclusions from bedside observations. Unfortunately our observations on liver infected rabbits were destroyed. It is probably in this or similar fields that a chemical differentiation between pancreatic and hepatic deficiency will be established.

10. The shortcomings of alkalization in diabetes at least is disclosed by insulin. The former will alter alkali levels without commensurate clinical improvement as is the case with insulin. Furthermore, the neutralization of the chyle destroys that cycle which stimulates pancreas and liver through a duodenal hormone activated by acid chyle. Thus alkalization disturbs the hormopoietic balance when given by mouth but by rectum results will sometimes follow when disappointment follows oral administration (mucous colitis). The complexities of the study of acidosis are disclosed by the variety of agencies that influence a low alkali reserve, some of which are here enumerated: a. Rest and light outdoor recreation. Severe exercise heightens acidosis. b. Diet, green vegetables, fruits, caseinates, as compared with potato and patent wheat flour starches and sugars. It is surprising the number of cases of diminished reserve which give a long history of such an unbalanced diet. c. Relief of pent up excretions (infected), such as infected urine retained above a ureteral kink. d. Raising oxygen tension of bowel, by enemata containing chlorine, by oxygen liberated from metallic peroxides (magnesium). c. By endocrine hormones, insulin, diabetes, ovarian residue also agomensis (ciba) in premenstrual acidosis, ovarian residue in climacteric hypertension with acidosis, corpus luteum in pregnancy. f. Drugs: Quinolium derivatives—chinoidin (crude), cinchonic acid, derivatives as phenyl cinchonic acid, phenolic acid derivatives as salicylates, and magnesium ion.

Another relationship disclosed in our studies is the frequency with which such states as the pathologist describes as lowered immunity (wherein members of the normal skin or mucous membrane flora become pathological), are concurrent with a diminution of alkali reserve. A subsidence of the infection has been found to parallel a rise in alkali reserve.

11. From observations on tissue reaction surrounding the infected zone to the application of Dakin's solution (war surgery).

12. The recommended solvent, chloroform, stimulates peristalsis excessively though not as a rule painfully. In this respect we have found it superior to a Noble's enema. Vegetable oils are solvents; where mineral oils are not so we use vegetable oils. Nearly all react with the alkaline hypochlorites and some with dichloramine-T. Methyl salicylate, however, is suitable, at least if freshly prepared.

13. The discussion of these drugs is advanced to throw light on the subject of vascular disturbances and their symptomatological expressions and not to advance their use in therapy which, however, will prove to be now and then serviceable.

14. By salines are meant the three salts, bromides, salicylates and hexamethylamine described.

15. The frequency with which these cases of atrophic colitis (spastic) have a history of an unbalanced starch diet is noteworthy.

16. By negative we mean that the ordinary physical examination fails to disclose any condition that can be ascribed as a causative factor of the presenting symptom.

17. So many cases of pronounced nervousness we find with chemical imbalances a word of comment is not amiss. In the first place these cases are at the lower margins of alkali reserve from 40 to 35 as a rule. If we do not get some such a reading we are convinced that our work is technically incorrect or that there is another factor causing nervousness, besides chemical imbalance. Another feature is lack of refreshing sleep. We have seen patients sleep with short periods of wakefulness for eighteen hours and still complain of no alleviation of fatigue. Frequently, patients will complain they do not sleep when every test shows them sleeping long and soundly. There is no rest in sleep with an acidosis of severity (always meaning by acidosis that concurrent metabolic disorder which is the basis). Even somnifacients do not yield refreshing sleep. The influence of sleep producing drugs on alkali reserve we found as follows:

Patients under treatment who report themselves refreshed by sleep we know show an improved blood chemistry picture. In fact we are ready to advance the dictum that repose is possible only under a correct chemical balance. If this proves true it opens up an immense field for study and improvement in the use and manufacture of somnifacients, and will prove a boon to the sleepless.

My thanks are due the Presbyterian Hospital (Chicago), and its staff, particularly Dr. Thor Rothstein, for assistance in these studies.

Three Cases of Mastoiditis with Interesting Complications*

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ACUTE MASTOIDITIS WITH THROMBOSIS OF LATERAL SINUS.

We present below the report of a case of acute mastoiditis, with thrombosis of the lateral sinus, discovered at primary opening of the mastoid, in which operation was followed by recovery. Thrombosis of the lateral sinus is usually a postoperative complication. Only in rare instances does the operator come upon a thrombosed and necrotic sinus at the primary mastoid operation that has not been diagnosed or suspected. In 1920 (1) we reported such a case, in which upon opening the mastoid cells we found a large perisinus abscess, the sinus bathed in pus, the sinus wall black and necrotic, and free pus in the lateral sinus. In this case the involvement of the lateral sinus occurred as a complication of an acute mastoiditis and was not diagnosed before operation. In the case we are now reporting the sinus complication was engrafted upon a chronic mastoiditis during an acute exacerbation. The diagnosis in this instance, however, was made before operation.

CASE I.—S. R., aged thirteen, male, was admitted to the Beth Moses Hospital, on May 21, 1922, complaining of pain in the right ear, discharge from both ears, headache, abdominal pain, and constipation. His family history was negative. The patient had had discharging ears since childhood, but otherwise had enjoyed comparatively good health. The present illness dated back to May 16, 1922, five days prior to admission to the hospital, at which time he began to complain of severe pain in the right ear. The discharge which had always been scanty now suddenly became copious. Examination at this period showed a foul scanty discharge in the external canal of the right ear with a drum membrane presenting a large attic perforation. The hearing was diminished about one third normal. There was no mastoid tenderness, and no evidences of any acute process going on in this ear. In the left ear there was a profuse discharge in the canal, the drum membrane presented a large central perforation, and was markedly inflamed and thickened. Hearing was markedly diminished. There was only slight tenderness over the mastoid region. Temperature was 102°, pulse 98, respirations 24. With these findings we decided to observe the patient for a few days.

On May 18, 1922, the patient's temperature rose to 104°, and he complained of severe pain in the left ear; also pain in the right side upon deep respiration. He had a hacking cough, and a general physical examination showed moist râles over the right base. On May 19, 1922, he had a distinct chill. This was followed by a rise in temperature to 104°, which remained practically constant. The mastoid was slightly tender. Palpation over the emissary region was slightly painful and there was no edema. After due deliberation we decided there was an otitic complication or a pulmonic condition which had not yet become fully manifest, and we advised that the patient be taken to the hospital for observation.

On admission, physical examination revealed the following: A boy, aged thirteen, anemic and pale, appearing to be acutely ill. Pupils were regular, reacting to light and accommodation. Ears showed slight mastoid tenderness over the left tip. His tongue was coated, and teeth in poor condition. The neck showed no adenopathy, no rigidity. Heart was normal, lungs showed diminished breathing over right base posteriorly with occasional fine dry râles. There was dullness on percussion over the same region. The abdomen was somewhat tender over entire surface, but no rigidity. Liver and spleen were not palpable. Reflexes of extremities were normal.

Diagnosis by admitting physician was acute mastoiditis, left, and lobar pneumonia, right lower. Blood culture was taken by Dr. Bender. On May 22, 1922, urine examination showed slight traces of albumin but otherwise was negative. White blood cells, 15,000; polymorphonuclears, seventy-seven per cent. Lumbar puncture (Dr. Zobel) fifty c. c. of clear fluid withdrawn under increased pressure, subsequent report otherwise negative. Blood culture reported sterile after twenty-four hours. The patient's condition was practically unchanged. Cough was loose and productive, but not troublesome.

On May 23, 1922, an x ray of the mastoids was taken by Dr. Bernstein. Mastoid cells on left side showed loss of detail with almost complete loss of structure. The condition was probably that of a moderate early involvement of the left mastoid. Blood culture was reported sterile after forty-eight hours. Another specimen was taken. Widal reaction with dilutions 1:20, 1:40, and 1:80 was negative after one hour.

From May 24 to May 30, 1922, the patient was kept under observation. The temperature curve was not typical of sinus thrombosis, the complication under consideration. The lung condition, although not very definite, seemed to clear up but the temperature did not abate. The latter was not very remittent and there was absence of chills, but profuse sweats were frequent. Under these circumstances we could not bring ourselves to operate. Repeated blood cultures were negative until June 1, 1922, when the laboratory reported streptococcus hemolyticus fifty colonies to the c. c.; with this finding we advised immediate operation.

On June 1, 1922, operation was performed. The mastoid was small and sclerotic. There were diseased granulations and free pus present about the region of the antrum. We cleaned out the mastoid

*Taken from the otological service of the Beth Moses Hospital, Brooklyn, N. Y.

thoroughly and found the sinus plate necrotic. Removal of the latter disclosed the lateral sinus covered with diseased granulations; the sinus wall was much thickened and discolored. We packed the mastoid cavity and went into the neck. The jugular was ligated below the facial and the wound drained. Returning to the sinus, the latter was packed off and incised and about a dram and a half of free pus evacuated. Examination of the specimen was subsequently reported streptococcus hemolyticus. There was no bleeding from the torcular end upon removal of the plug. We uncovered the sinus plate further back and then upon curetting out a number of well organized clots we finally obtained bleeding, but not of a very free nature. Removal of the bulbar plug was not followed by bleeding. Even after clots were removed no bleeding occurred. By this time the patient was pretty low and we quickly packed the mastoid wound. The patient was given an intravenous injection on the table and put upon stimulation.

On June 3, 1922, the patient had rallied from the operation, his pulse was much better, but the temperature had again risen to 103°. A blood culture was taken; blood count, white cells, 16,000; polymorphonuclears, seventy-eight per cent. June 4th, 5th, 6th, 7th and 8th, the patient's condition seemed to improve. The high temperature persisted, however, with remissions, the crest of each elevation being lower with each subsequent rise. Blood cultures were taken daily. On June 4th, there were twenty colonies; on June 6th, there were four colonies, and on June 7th and 8th the reports were sterile after twenty-four hours. Dressing was changed on June 8th; nothing unusual noted. On June 9th, the temperature reached normal for the first time, and thereafter it never rose above 100°. The patient improved rapidly, gaining in strength; his appetite was good, and he slept well at night. On June 21st, the patient left the hospital well on the way to recovery.

Dressings were continued in our offices until July 27, 1922, almost two months after operation, at which time he was discharged as cured. The middle ear was dry, but there was present the same central perforation noted at the time of the first examination. The hearing was markedly diminished, due purely to a conductive lesion, the bone conduction showing an increased Schwabach. The neck wound and the posterior wound were both securely and firmly healed.

SINUS THROMBOSIS WITH SPONTANEOUS RECOVERY

The following case of acute mastoiditis presented symptoms typical of sinus thrombosis, which persisted for one week. Recovery took place without operation.

Otologists agree that in a given case in which after a mastoid operation there appear symptoms of sepsis that cannot be accounted for elsewhere, we are justified in making a diagnosis of sinus phlebitis or thrombosis. A positive blood culture makes the diagnosis absolute. There are cases, however, in which this latter corroborative finding is lacking and under these circumstances conservatism must be observed for a longer period. If at the time of operation the sinus wall is found to be diseased our suspicions are more or less confirmed even without a positive blood culture. Nevertheless, the case we are reporting is one in which symptoms of sepsis followed the mastoid operation. The patient's condition, instead of growing progressively worse, remained fairly good. There was absence of pallor, and the blood cultures were returned negative. It was for this reason that we procrastinated in operating upon this patient even in the face of six distinct rises of temperature, and that our conservatism was justified is evidenced by the patient's recovery without operative intervention.

Case II.—I. A., male, aged fourteen, was admitted to Beth Moses Hospital on April 10, 1922, complaining of discharge from the left ear, pain, and headaches. His family history was negative, and his previous personal history showed that he had had the usual diseases of childhood. He had always been anemic and undernourished, but never had ear trouble previously. His present illness dated back five weeks prior to admission to the hospital, at which time he suffered from earache. The ear was irrigated and several days later the drum membrane ruptured spontaneously. The ear discharged profusely for several weeks and then gradually subsided. The pain in the ear persisted. One week prior to admission it increased in severity to such an extent that the patient could not sleep at night. Headaches were persistent over the left parietal region.

Physical examination upon admission showed a boy, aged fourteen, who appeared acutely ill. Pupils were regular, and reacted to light and accommodation. His teeth were poorly kept, tongue coated, breath foul. The right ear was negative, left showed marked edema over the mastoid region. There was tenderness over antrum and tip, and emissary region; discharge was moderate in amount. The drum membrane presented perforation in anterior quadrant, with marked sagging of the posterior superior canal wall. Neck, chest, abdomen, extremities, all were negative.

Diagnosis, acute mastoiditis, left. X ray report by Dr. Bernstein: Left mastoid showed breaking down of cell outlines; white blood cells, 12,000; polymorphonuclears, seventy-six per cent. Urine examination showed slight traces of albumin, otherwise negative.

A simple mastoid operation was performed on April 11, 1922. The left mastoid was opened and found to be extensively diseased, free pus was encountered far back to the sinus plate, the latter being softened, and the sinus covered with granulations over an area one fourth of an inch in diameter. The mastoid was thoroughly cleaned out and the tip removed. The cavity was packed with iodoform gauze. On April 12, 1922, the patient had rallied from the operation and was fairly comfortable; temperature 101°, pulse 90, respiration 22. On the 13th, 14th and 15th, the patient improved rapidly, and it appeared that he was going to have an uneventful convalescence. His appetite was good, and he slept well at night. On the 16th the first dressing was changed. The wound was found to be clean, and the cavity was repacked lightly with plain gauze. On the evening of April

19th the patient's temperature rose to 102°, and he complained of headache. The dressing was changed the same day, wound was found to be clean and nothing unusual noted.

April 20th, the patient had a chill, followed by a rise in temperature to 104°, after which there was profuse sweating. Blood culture taken by Dr. Bender. Spinal puncture, twenty c. c. of fluid withdrawn under slight pressure; pathological examination of fluid negative. Urine examination was negative. White blood cells 13,000, polymorphonuclears seventy-one per cent. On April 21st blood culture was reported sterile after twenty-four hours. Another specimen was taken. Patient's temperature that evening rose again to 103°, but there was neither chill preceding nor sweat following. The placing this on record as a case of sinus phlebitis or thrombosis in which recovery took place spontaneously. Nothing but an involvement of some portion of the blood stream after a mastoid operation can we conceive as giving rise to such a clinical picture and running such a clinical course. The wound was clean, ruling out septic absorption from this site. There were no evidences of inflammation of any kind of the wound edges, or the region thereabout, thus ruling out erysipelas. The heart and lungs were normal throughout, and the urine was negative. We are therefore assured that the source of these six distinct elevations in temperature, with such sharp remissions, should be sought for only in the lateral sinus.

At the primary operation the sinus wall showed

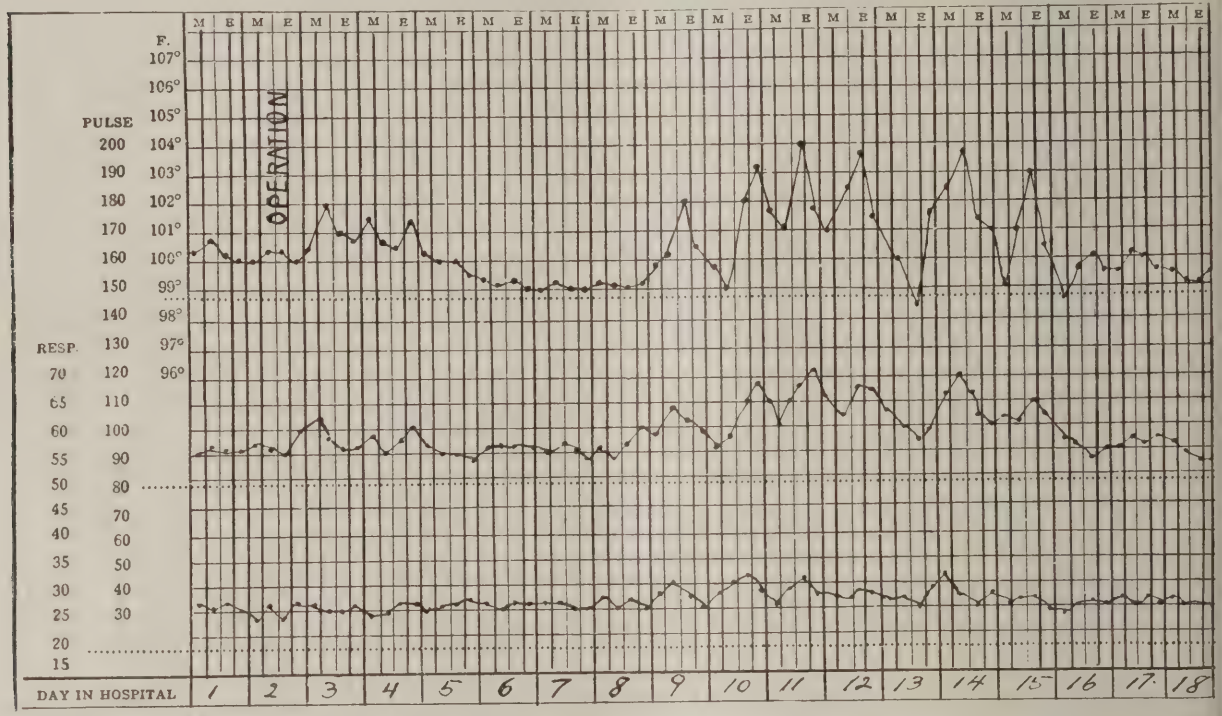

Chart.—Showing the clinical course of a case of mastoiditis simulating sinus thrombosis. (Case II.)

general condition of the patient, however, was fair and he did not seem to be acutely ill. Dressing was changed. The wound was clean, no evidences of cellulitis. Pressure over posterior of wound seemed to elicit pain. On each of the following three days the patient had a distinct rise in temperature above 103°. In the morning the temperature remitted. There were no chills but sweating occurred; yet the patient seemed comfortable. Repeated blood cultures were negative. The highest blood count during these three days was white blood cells, 15,000; polymorphonuclears, seventy-eight per cent. On April 25th, for the first time in six days, the temperature did not rise, and for some reason it remained below 100° thereafter, and although we did not resort to any operative procedure, the patient went on and made an uneventful recovery. On May 1st he left the hospital and on June 3d, almost eight weeks after operation, we discharged him as cured. The posterior wound was firmly healed and the middle ear was dry.

After due deliberation we almost feel justified in evidences of disease, and it is reasonable to suppose that the septic nature of the temperature should be attributed to extension into the sinus. This possibly was an infection, not so severe as to cause involvement of the general blood stream, being limited to that particular portion of the sinus. We are certain that in the hands of some more radical practitioners this patient would surely have reached the operating table even before the sixth rise in temperature, but in the absence of confirmatory blood cultures, and with the patient's general condition not seemingly growing, we felt justified in waiting. As a matter of fact, the patient was scheduled for operation on the seventh day, but the temperature failing to rise, we decided to wait still longer, luckily for the patient.

CHRONIC MASTOIDITIS. ACUTE EXACERBATION. RADICAL MASTOID OPERATION FOLLOWED BY ACUTE ENDOCARDITIS AND BACTERIEMIA.

Case III.—G. L., aged thirteen, female, was admitted to the Beth Moses Hospital on June 29, 192

the chief complaint being pain in the left ear, swelling over the mastoid and discharge. Her family history was negative. Her previous personal history showed that seven years ago, at the age of seven, she had a severe attack of acute articular rheumatism, at which time the heart became involved. As a result, she was left with a chronic valvular lesion, but she experienced no inconvenience, no shortness of breath upon exertion, and apparently enjoyed good health. Two years ago she had an attack of acute otitis media. The ear ruptured spontaneously and discharged profusely for several months, after which time it abated for the most part. Ever since the ear had been discharging more or less freely, the discharge having a distinctly offensive odor.

The patient's present illness began four weeks prior to admission to the hospital, when she took cold and several days later began to complain of severe pain in the left ear. The discharge increased in amount and headaches were noted, particularly in the evening. The condition continued and apparently grew progressively worse. One week later there appeared a swelling behind the left ear and soon after the headaches seemed to be somewhat mitigated. The family physician treated this swelling expectantly for two weeks. It gradually increased in size until one day before admission to the hospital when we saw the patient in our office. At this time the following was noted: The patient was markedly anemic and pale, and looked acutely ill. Her temperature was 102°, respiration 27. Examination disclosed a profusely discharging ear, sagging and narrowing of the canal, with a fluctuating swelling behind the auricle. A diagnosis of acute mastoiditis was made, and the patient advised to enter the hospital for immediate operation.

The important features of the physical examination at time of admission on June 29, 1922, at 6 p. m., were:

The otological examination was as noted above. The heart examination revealed a rather vigorous apex beat located within the mammary line, in the fifth intercostal space. Palpation disclosed a distinct thrill over the mitral area. Percussion showed some cardiac enlargement outward and downward. Upon auscultation there was noted a presytolic murmur with an accentuated P^2, also a systolic blow transmitted to the axilla. The muscular quality of the heart sounds was otherwise good. The remainder of the physical examination was negative.

On June 30, 1922, the white blood count was 28,000, polymorphonuclears eighty-five per cent. Urine was negative. X ray report by Dr. Bernstein was as follows: Left mastoid showed complete obliteration of cell outline; mastoid area seemed rather dense with scattered areas of pus formation. Sinus could not be visualized. Condition seemed to be an acute mastoiditis engrafted upon a chronic sclerotic mastoid. Radical mastoid operation was performed on June 30, 1922.

A large quantity of pus was found beneath the soft parts. Retraction of the periosteum revealed a large cortical perforation in the region of the antrum. The mastoid was extensively diseased, and was thoroughly cleaned out, after which we proceeded to the classical radical operation. Siebenmann's plastic was used; the posterior wound sutured one third, and the cavity cleaned and then packed with iodoform gauze. On July 1st the patient had rallied from the operation; temperature 100°, pulse 110, respiration 28. On July 2d the patient improved rapidly. The temperature reached normal on the fifth day and never rose above that. The pulse was good, and there were no evidences of any cardiac involvement. The dressing was changed on the fifth day, the wound was clean, and nothing unusual noted. In view of the fact that it seemed this patient was going to have an uneventful recovery with the temperature flat for five days, she was discharged from the hospital on July 10, 1922, eleven days after operation.

The patient came to our office for subsequent dressings on July 13 and 15, 1922. She appeared well and complained of no pain, slept well at night, and had a fairly good appetite. On July 16th we were called to see her at her home at which time she had a temperature of 103°, pulse 110, respiration 32. She did not give a history of having chills, did not vomit, was not dizzy, but nevertheless we suggested return to the hospital. She was readmitted on July 17th.

On July 18th the temperature remitted in the morning but reached 103° in the evening, pulse 145, respiration 38. Blood culture reported negative for twenty-four hours. White blood count, 12,000; polymorphonuclears, eighty-six per cent. Heart examination showed the pulse to be rapid, weak and markedly irregular as to volume and rhythm; visible pulsations in neck marked; cardiac apex one inch beyond nipple line in sixth intercostal space; marked thrill over precordium. Heart enlarged downward and outward beyond anterior axillary line; heart sounds weak; first sound poor, muscular quality; presystolic roll audible. P_2 still audible, loud blowing systolic murmur present transmitted to the axilla and back.

On July 19th the temperature was 102°, pulse 160, respiration 44. Patient was dyspneic and slightly cyanosed. Lung examination was negative. Blood culture reported sterile after hours and another specimen taken. Cardiac condition had not improved.

On July 20th the temperature was 103°, pulse 158, respiration 45. Blood culture reported the presence of Streptococcus viridans; incubation period forty-eight hours; 100 colonies to the c. c. of blood. Mastoid wound was dressed. The wound was found to be clean, with but little attempt at granulation. White blood cells, 13,000; polymorphonuclears, seventy-eight per cent.; red blood cells, 3,200,000; hemoglobin, sixty per cent. With the presence of a positive blood culture of the Streptococcus viridans and with evidences of an acute endocarditis it was decided that the case was no longer otological and the patient was transferred to the medical service.

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Practical Therapeutics

TWENTY-SEVEN CASES OF SYPHILIS TREATED BY INTRAVENOUS INJECTIONS OF METALLIC MERCURY*

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The intravenous use of mercury, either as salts or metallic mercury, is obviously of growing importance in the treatment of syphilis. Yet, in spite of this, the literature and textbooks on pharmacology are incomplete, which fact may be due to a lack of sufficient clinical experience. The number of mercury preparations which have been used intravenously is unusually large, the majority of which have received more or less satisfactory comment. Yet, in few instances, has any mercurial been given a fair trial, especially by competent medical authorities, except in Germany where they have been used quite extensively, and reported favorably.

In going over the reports, we find that the main disadvantages are, first, a tendency to thrombophlebitis, and, second, when used in larger doses, the production of stomatitis and nephritis. On the other hand, where no such unfavorable results were found, there was no distinct advantage of the intravenous over the intramuscular route.

Mercury intravenously compares favorably with arsenic in causing the disappearance of cutaneous lesions, and acts not merely as a symptomatic remedy, but exerts a definite action on the course of syphilis. Howard (1) reports favorable cutaneous and serological results by the use of mercury cyanide intravenously. In over five thousand injections he has not observed any untoward reactions. On account of the pain caused by intramuscular injections, Butler (2) has used a synthetic preparation, mercurosal, intravenously, which has not produced symptoms of mercurialism, nor any unpleasant reactions in his hands. Therapeutically, this preparation was considered just as effective as any other mercurial by Williams (3).

On the other hand, Cole, Driver and Hutton (4), report the use of mercurosal in thirty-eight patients with syphilis who were under close observation. Many of these patients improved under its use, but no definite evidence was obtained indicating the superiority of this preparation over other mercurials.

White (5) and his associates, in ninety-six cases, have used flumerin, a mercurial drug suitable for intravenous injections, with low toxicity and absence of local irritating qualities. Their results have definitely shown that flumerin is of value in the treatment of syphilis, although it should in no way supplant the arsenicals.

Brumauer (6) has used a colloidal preparation of mercury, diphasol, containing five per cent. of metallic mercury. Reactions were few and slight, and the usual signs of mercurial poisoning rarely noted. As a rule, primary and secondary lesions cleared after five or six injections.

Ireland (7) reports the treatment of fifty patients with mercodel (then called lueside) being enabled to give much larger quantities of mercury without any disagreeable reaction of either a general or local nature. He further remarks, in the same article, that he believes the ability to administer larger quantities of mercury than has hitherto been possible will markedly advance the treatment of syphilis.

Believing also, this last statement to be true we have treated and are here reporting, twenty-seven cases of syphilis, in various stages, from the service of Dr. Alfred Potter at the Kings County Hospital, with intravenous injections of a colloidal mercury, known as mercodel.

Mercodel is provided in ampoules of five hundred milligrams of metallic mercury in a very finely divided, or colloidal, state, and 2.43 grams of glucose. The contents of the ampoule are to be dissolved in fifty cubic centimetres of sterile distilled water, the glucose making an isotonic solution of the whole. Since the mercury particles settle rather rapidly, it is necessary to shake the solution thoroughly for a few seconds before the injection, to insure having the proper quantity of mercury in each cubic centimetre of fluid withdrawn from the container.

The technic of the administration is as follows: The solution having been made as above, a glass adapter filter containing cotton is placed on the syringe. Venipuncture is then made in the ordinary manner, after which the mercodel solution, after shaking, is drawn through the cotton filter into the syringe, the filter is then removed and the syringe attached to the needle, which is already in the vein and the solution rapidly injected (one half minute). Slow injection of the solution allows a considerable quantity of the metallic mercury to adhere to the sides of the syringe, with a consequent loss in the quantity received by the patient. This is also the reason for placing the needle in the vein before drawing the solution into the syringe.

The injection does not really consist of a solution of mercury, but a temporary suspension of the mercury particles, which is of a grayish color. At first one would fear that embolism would occur, but upon reflection one realizes that metallic mercury is a true liquid, and can therefore pass through even the finest of capillaries.

The part played by mercury in the treatment of syphilis has long been known, and the ground it has given way since the introduction of the arsphenamines is gradually being recovered.

That this metallic mercury is soluble in fats, oils and lipoids, has been proved, and its effectiveness is held to be due to this fact.

In order to show the rapidity with which this mercury penetrates the various organs of the body the manufacturers injected sixty milligrams into a rat, which was killed and exsanguinated two hours later. Analysis of the organs showed forty per cent. in the liver, thirteen per cent. in the spleen, and five per cent. in each the blood, heart, brain, kidneys, and lungs. There was six per cent. in the stomach and

*Read before the Brooklyn Urological Society, Tuesday December 9, 1924.

intestines with contents, and the remainder, eleven per cent., was in the muscle, bone marrow, etc.

Of the twenty-seven cases we are about to consider, six were in the primary stage, in five both primary and secondary lesions were present, seven were secondary alone, seven tertiary, and two were of congenital syphilis. The youngest patient treated was fourteen years of age, and the oldest was forty-six.

Four cases received only one injection; six cases, two injections; one case, three injections; two cases, four injections; two cases, six injections; five cases, seven injections; one case, eight injections; one case, nine injections; one, ten injections; one, eleven injections, and one, twenty-five injections.

In addition to these there were two cases, one with a primary lesion which healed after two injections (260 mgm.), when the patient left the hospital, returning three months later with mucous patches, for which he received five more injections (640 mgm.). In the other case the patient had a primary lesion with a generalized maculopapular secondary lesion for which he received ten injections (1.91 gms.) and returned three months later with a papulovesicular secondary lesion, when he received nine more injections (0.9 gms.).

In twenty-four cases the Wassermann was four plus at the beginning of treatment, in two cases it was three plus, and in one case of tertiary syphilis with gumma of the palate, it was doubtful. The first case of recurrence, in which only two injections had been given, the Wassermann was four plus on return, and the other, having had ten injections, it was three plus on return.

Of the twenty-seven cases, Wassermann tests were not obtained later in treatment in twelve cases—these being divided as follows: one injection, four cases; two injections, five cases; four injections, one case; six injections, one case. Also in the first mentioned case of recurrence, no discharge Wassermann was taken on either visit.

Of the remaining fifteen cases the following results were obtained: Seven were improved serologically, and eight were unimproved serologically. Of the cases improved three were three plus after seven injections or 1.03 gm., nine or 0.85 gm., and eleven or 1.33 gm.; two were two plus after seven injections or 2.45 gm., and ten or 1.44 gm.; one was doubtful after nineteen injections or 2.98 gms.; one was negative after eight injections or 1.01 gm. plus eight salvarsan injections.

The effect on the lesions was more encouraging even than this. Excluding the four patients who left the hospital after only one injection, and in which sufficient time had not elapsed to show any improvement, we find that including the two recurrences, we had ten primary, eight secondary, and four tertiary lesions, one of which was a periostitis of both tibia, one a rupial syphilide, and two gumma of the palate.

Of the ten primary lesions one healed after two injections, three healed after four injections, one was healed at discharge after receiving six injections, and one was healed at discharge after receiving seven injections.

Two patients having received only two injections, one patient with four injections, and one with seven injections, were noted to be recovering when they voluntarily left the hospital.

Of the eight patients with secondary lesions one recovered after three injections, four recovered after four injections, two recovered after five injections, and one recovered after six injections.

Of the four tertiary lesions, in the case of periostitis the patient was improved with only two injections, the case with rupiæ cleared after four injections, and in the cases of gumma of the palate the patients received two and nine injections, respectively, and were discharged improved.

This brings us up to a statement in regard to doses of the drug, and reactions to it.

When we first began using mercodel we gave somewhat larger doses than we do at the presen time. We began with twenty or twenty-five c. c. which represents two hundred or two hundred and fifty mgm. of mercury, and attempted to increase the dose five c. c. with each injection, to a maximum of fifty c. c. a dose, and very soon discovered that this intensive treatment nearly always provoked abdominal cramps, diarrhea (sometimes bloody), stomatitis, gingivitis, and salivation, although there never were any nitritoid crises nor anaphylactic shocks. We now begin with five or ten c. c. of the mixture, representing fifty or one hundred mgm. of metallic mercury, injecting twice a week, and increase the quantity with each subsequent injection until we produce salivation or gingivitis, at which point we hold the dose until the patient's tolerance increases. Rarely is it necessary to discontinue the drug because of these latter symptoms.

Of the twenty-seven patients, eight presented no symptoms whatever—of these, four received only one injection, two received two injections, one received three injections, and one received seven injections. Of the remaining nineteen patients, ten showed either slight stomatitis or gingivitis, and one a marked stomatitis. Diarrhea to a mild degree was apparent in six cases, and to a marked degree in two cases, in one of which there were bloody stools after the first injection only, but not after any other injection, in spite of the fact that the quantity was increased.

Uranalyses were done in all cases twice a week. In no instance did there appear more than a faint trace of albumin—ten cases—in four of which this was exhibited in only the first or second specimen. The other six were negative upon discharge of patients from the hospital. A few hyaline or finely granular casts appeared three times, but were absent when the patients were discharged.

Cole (8) states that thrombosis of the veins was one of the greatest drawbacks to the administration of this drug. A large number of our injections were given by various of the hospital interns under the supervision of either one of us, and we can definitely state, that while we saw thromboses in several instances, it never occurred in this series in a case where we had not the knowledge, definitely, that the technic had been imperfect, either the vein having been injured by the needle, or actual infiltration with mercury having occurred. However, in one case not included in this series a patient receiving his injections in the alternate arm each time, had thrombosis occur after the seventh injection in each arm, i. e., after the thirteenth and fourteenth injections. This represents the only case of true thrombosis seen.

CONCLUSIONS

1. It is possible to administer a larger quantity of mercury in a shorter period of time by this method than by the use of the soluble salts.

2. The lesions disappear at least as rapidly under the administration of this drug as with any other now being used.

3. The smallest number of injections which produced any change in the serology was seven, representing 1.03 gm. of mercury. The smallest quantity of drug showing any serological change was 0.85 gm. given in nine injections.

4. Stomatitis or gingivitis in mild forms is a quite common sequel to the administration of the drug, but does not become severe under the principle of the smaller doses, if this dose is not increased while the symptoms are present.

5. While traces of albumin and a few casts may appear in the urine, they will disappear either under a continuation of the treatment, or promptly upon discontinuing it.

6. Thrombosis did not occur in this series in any instance where the technic was unimpeachable, although we have seen it occur twice in another case after the seventh injection in each vein.

7. We believe this mercurial to be potent, safe, and worthy of further trial.

We wish to express our thanks to Dr. Alfred Potter for allowing us to administer this drug to the patients on his service, and also for helpful suggestions during the preparation of this paper.

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Vaccine Therapy.—C. Bucura (*Zentralblatt für Gynäkologie,* August 2, 1924), found the result of treatment for gonorrhea and other inflammatory diseases of the female genitals very satisfactory in the large majority of cases, but not always ideal. The initial dose of 100 million bacteria, that is 0.1 c.c. of the vaccine, is given in the substance of the vaginal portion of the cervix and every accessible gonococcus focus is treated locally at the same time. The treatment includes also physical methods in the form of baths, diathermy, quartz lamp therapy, caseosan, aolan, electrargol and milk injections. If a reaction sets in after the first injection, the next injection is given one or two days after the reaction has entirely subsided and the same dose is continued until a reaction is no longer produced. The dosage is then always increased by one hundred million bacteria. A dose of more than six hundred million bacteria was never found necessary and never given. The gonococcus vaccine used by the author contained one thousand million gonococci to one c.c.; the mixed vaccine contained one thousand million gonococci, one thousand million staphylococci, two thousand million colon and bacilli and twenty million streptococci to the c.c. The mixed vaccine was given either when the gonococcus vaccine was found valueless or from the very outset in inflammatory diseases when gonorrhea could be definitely excluded.

The contraindications for vaccine therapy, especially with mixed vaccine, (simple gonococcus vaccine is rarely contraindicated) include all inflammatory and suppurative processes in other important organs (active apical processes, cavities, severe bronchitides, suppurating sinuses, etc.) as well as severe cachexias.

The criterion of a cure includes complete absence of clinical symptoms and negative microscopical bacteriological findings in the secretions during a period of observation of two, or better, three months, with at least three examinations per month—postmenstrual, in the middle period between two menstruations and just before menstruation.

Treatment of Hyperidrosis and Bromidrosis of the Extremities.—Clottens (*Bulletin de la Société des sciences médicales de Montpellier,* February, 1924) notes that the measures commonly employed, such as applications of diluted formaldehyde solution, saturated picric acid solution, absolute alcohol or 1:20 chromic acid solution, bathing the feet in lead subacetate solution or three per cent. potassium permanganate solution, and the use of tannic acid or alum powders, are only temporarily effective, the layer hardened by these agents dropping off in fifteen to twenty days, leaving a macerated layer which requires renewed treatment. For such maceration, a simple procedure popularly advocated in Flanders is effective, viz., sprinkling sifted wood ashes in the hose. The activity of fermentative bacteria is combatted by cleanliness and the use of powders of salicylic acid and talcum. In bromidrosis the fetor may, no doubt, be partly of bacterial causation, but in true bromidrosis it is primary, hard to overcome, and often a family peculiarity. The author recommends in these cases a combination of four parts of formaldehyde to ninety-six parts of creosote. This is dusted daily in the hose and between the fingers. Decomposing gradually into its two components, this combination markedly reduces the hyperidrosis without "fixing" the skin. Maceration of the feet is checked and even the deepest interdigital excoriations are cured in a short time. The microbic flora is inhibited. The remedy may also be of service in similar disorders; thus, among others, it was used with success in a case of intertrigo in a stout woman.

Cocaine, Butyn, Tutocaine, and Other Local Anesthetics.—The experiments of A. J. Copeland (*British Medical Journal,* July 12, 1924) show that the best of the local anesthetics for the eye are cocaine and butyn. Tutocaine may also have a use. Tropacocaine, novocaine, and eucaine are less valuable for deep anesthesia. For the nose, cocaine and tutocaine are alone useful. For subcutaneous injection novocaine is much the best. Besides cocaine, it is believed that the properties of butyn and tutocaine may render them addiction drugs.

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A Study of Eighty Cases of Acne Treated With X Rays

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The question arises whether the application of x rays when used in a proper manner exert a harmful influence upon the skin or not. In this article it is proposed to outline the different types of acne and to give the results of the combined treatment (x rays, local application of medicaments, etc.), together with a consideration of any harmful results that may occur. The experience of the past few years has taught all dermatologists that x rays are the most successful local agent in treating acne.

It is generally accepted among dermatologists that the acne bacillus is the etiological factor; whether we accept Sabouraud's (1) view that the acne bacillus (microbacillus) causes only the comedone or Gilchrist's (2) view that the acne bacillus may cause all the characteristic lesions of this condition, is a matter of opinion. The acne bacillus is present on every normal skin after puberty. The characteristic lesions of this condition, as we know them, are usually found in individuals whose normal resistance has been lowered. Therefore, it is unwise to rely exclusively upon x rays to eradicate permanently a condition which is initiated probably by constitutional derangement.

CLINICAL TYPES

The clinical picture of acne vulgaris is too well known to occupy time and space except to state briefly the classification followed in the charts. The comedone occasionally predominates exclusively but usually we see the mixed type consisting of comedones, papules and superficial pustules. On the other hand instead of the superficial pustules there may be brownish red dermic abscesses or indurated lesions. Less often we see what Brocq (3) describes as *acné mentonnière indurée profonde,* which is a papulopustular acne confined to the chin, usually occurring in women between twenty-five and forty-five years. There are usually five or six lesions appearing in an uninterrupted succession; after the complete involution of one lesion another begins. The French school believes this condition closely allied with disturbances of the uteroovarian organs or the nervous system. Bazin (4) has described an acneiform eruption due to the ingestion of certain medicaments, principally the iodides. Although this condition is well known to all physicians the possibility of its occurrence must be kept in mind for it may closely simulate a true acne vulgaris. Occasionally recourse to the history may be necessary in order to differentiate between them. It was thought advisable to include acne rosacea in our discussion of acne vulgaris because of its similarity in reaction to x rays, as well as the closely related contributory factors in the two diseases.

X RAY TREATMENT

It is unnecessary at this time to trace the history of x rays in acne as it has been recently chronologically stated in an article by Howard Fox (5). Suffice to say that Gautier (6) reported the first case treated by x rays: numerous French and German writers followed him. In America Hyde, Montgomery and Ormsby (7), Pusey (8), Engman (9) and others were early workers in this field of therapy. At the present time our dose may be accurately measured, due primarily to the arithmetical formula of Remer and Witherbee (10). With this increased knowledge of radiotherapy, with a proper technic and approximately sixteen treatments we may fairly well ascertain the end result of our acne cases. MacKee (11) in his book has stated so clearly the procedure, dose, etc., that the treatment has been greatly simplified. He has always insisted upon one quarter unit doses to each cheek weekly. The best results are probably obtained by this dose. It is safe and perhaps should be adopted by all dermatologists if for no other reason than to control results in transient patients. Whether to use astringent lotions or not during irradiation is still questionable. As a rule we have not done so; on the other hand, Wise and Eller (12) have used them without any harmful effects.

The accompanying chart which is discussed later on, comprises eighty cases in which the patients were treated privately by us. In each patient the clinical type, focus of infection and recurrences were noted, as well as the duration of the condition, age, sex, etc.

The most important question is the number of recurrences following x ray treatment. In this group

Fig. 1.—Severe case of acne indurata completely cured after sixteen x ray treatments.

of patients there were ten per cent. of recurrences. This includes all types of acne excepting acne rosacea and acne varioliformis. The word recurrence here is restricted to the appearance of several comedones, papules or pustules occurring three weeks to three months after the last x ray treatment. Where cooperation could be obtained astringent lotions were begun two weeks after the last x ray treatment. The number of recurrences were less in this group. It is understood, of course, that a few papules just preceding or during menstruation are not to be considered a recurrence, for this may be the usual occurrence in normal women. Of the eight cases which recurred six were later satisfactorily cured by further röntgenization, but the remaining two had to be considered improved rather than cured.

It is always advisable in acne to follow x ray at the end of the course of irradiation by local treatment. Any one of the well known astringent lotions may be used. The patient should produce a slight peeling or roughening of the skin for six to eight months. The strength of the lotion must be increased from time to time.

The average number of x ray treatments in our series may be placed at sixteen; that is, exposure weekly to one quarter unit doses for sixteen weeks. Occasionally it was necessary to give a one quarter unit to each cheek and one eighth unit to the front of the face. Some patients may require a few less and others a few more. It is not advisable, however, to exceed eighteen quarter unit doses in a single course unless the acne is upon the chest or back. An exception may be made if the patient is a male, brunette, with a severe indurated type and shows no perceptible skin change. However, it has been our experience that the indurated type of acne responds most quickly and therefore extended treatment is usually unnecessary.

The danger of too many exposures is a disagreeable dryness or perhaps wrinkling. MacKee does not believe telangiectasia may occur unless an erythema has been produced. In his series he has never seen telangiectasia nor radiodermatitis develop. He noticed, however, ten patients with slight wrinkling. In our series no telangiectasia has ever been noticed but in two patients a dryness became evident after eight and ten treatments, respectively. These patients were receiving one quarter unit doses to each cheek weekly. When the dose was decreased or the interval lengthened the sebaceous glands soon became reasonably active and the skin lost its disagreeable dryness. On the other hand, the skin was never as oily as formerly; this, of course, is the desired result. In some patients we found that wiping the face with pure grain alcohol twice daily removed the excess oil.

In fifteen patients the acne was so pronounced that it was necessary to give one eighth unit doses to anterior portion of the face and one quarter units to each cheek. Two of this number exhibited slight wrinkling but they themselves were not aware of this. This wrinkling did not occur until several months after cessation of irradiation. It is interesting to note that after the fourth weekly treatment in one and the fifth weekly treatment in the other a faint erythema appeared. The machine was carefully checked and a search made for faulty technic, but nothing was found. Nor were other patients affected in a similar manner at this time. We discontinued treatment for two weeks and then proceeded more cautiously, applying only eighth unit doses to each cheek and not x raying the front of the face. Later quarter unit doses were given to each cheek at weekly intervals with no further erythema. These patients were both blondes and received sixteen treatments in all. We must conclude from this that faint erythema may be

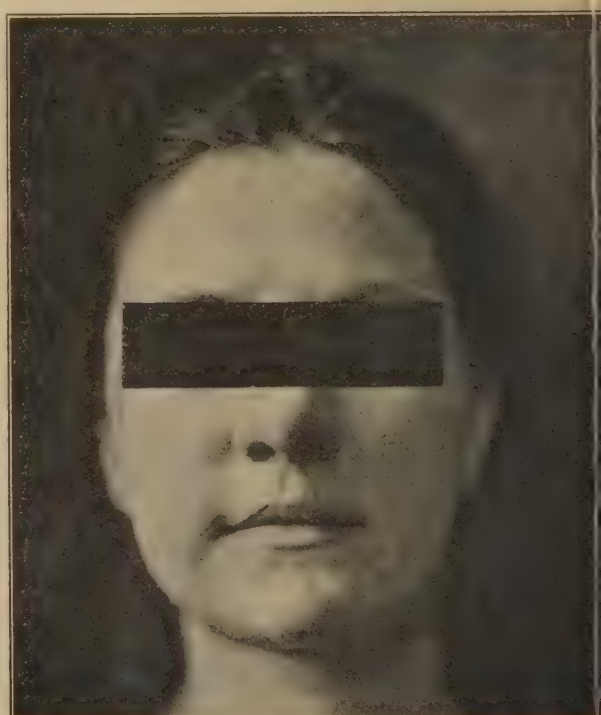

Fig. 2—Front view of patient shown in Fig. 1 after sixteen x ray treatments.

FIG. 3.—Case of comedo type of acne with some papules. X ray treatment of this type gives excellent results.

roduced by this dose (one quarter unit to cheeks nd one eighth to front of face) in certain susceptible ersons.

We believe that this early erythema had a causal elation to the subsequent wrinkling or atrophy. Mac-ee states that in one patient there was clinical atro-hy without telangiectasia two years subsequent to mild first degree reaction. Atrophy or wrinkling nay also result from long continued fractional treat-nent but the usual course of sixteen treatments, pro-ided no erythema appears, does not in our opinion roduce atrophy.

However, one should always be on the watch for n erythema. The patient's skin should be examined efore each exposure and if erythema is noticed all reatment should be suspended for at least three veeks. After this interval one should proceed cau-iously, giving only eighth unit doses to each cheek veekly. If no erythema appears the standard frac-ional dose may be given. If attention is paid to hese details, and if we bear in mind the occasional ypersensitiveness to x rays, disagreeable results may e avoided. The treatment of acne by x rays may ow be considered our best therapeutic agent in this hronic and disfiguring disease.

The chart indicates that the greater incidence was mong females but we believe these figures taken rom private practice to be erroneous. It is our pinion that both sexes are equally affected but vomen seek relief more frequently than men.

Since acne is a disease manifesting itself at puberty t is natural that there are many more cases among ingle persons than among the married. Our chart hows ninety-three per cent. among the unmarried. n the same series sixty per cent. of those with acne osacea were married. This is to be expected when ve note the average age was thirty years. The question often arises whether the patient will outgrow acne vulgaris. Frequently, if it is quite mild, they may, but usually it progresses, leaving the face disfigured by scars. Marriage will not cure acne. If masturbation has been practised a normal marriage may alleviate it, but in general the condition progresses until some definite treatment has been adopted. It is essential to treat acne early if the best results are to be obtained.

FOCUS OF INFECTION

Every patient should be carefully examined for possible foci, particularly teeth, tonsils, sinuses and the gastrointestinal tract. One of us has seen an acne recur after two courses of x rays only to be permanently cured by the extraction of a devitalized abscessed tooth. Where devitalized or gold crowned teeth are present radiograms should be made and a rational decision reached by dentist and radiographer. Smelhaus (Prague) (13) reports four cases of acne in which the eruption promptly disappeared after the cure of necrotic disease of the tooth pulp. Only when the pulp is necrotic, however, is a connection between disease of the teeth and acne to be taken for granted; the acne is caused by products of putrefaction entering the intestinal canal. In cases of acne in which the pulp was intact or only inflamed (not yet necrotic), treatment of the teeth was without results. We do not advise enucleation of tonsils unless there is definite evidence of disease and this should be left to the judgment of the rhinolaryngolo-

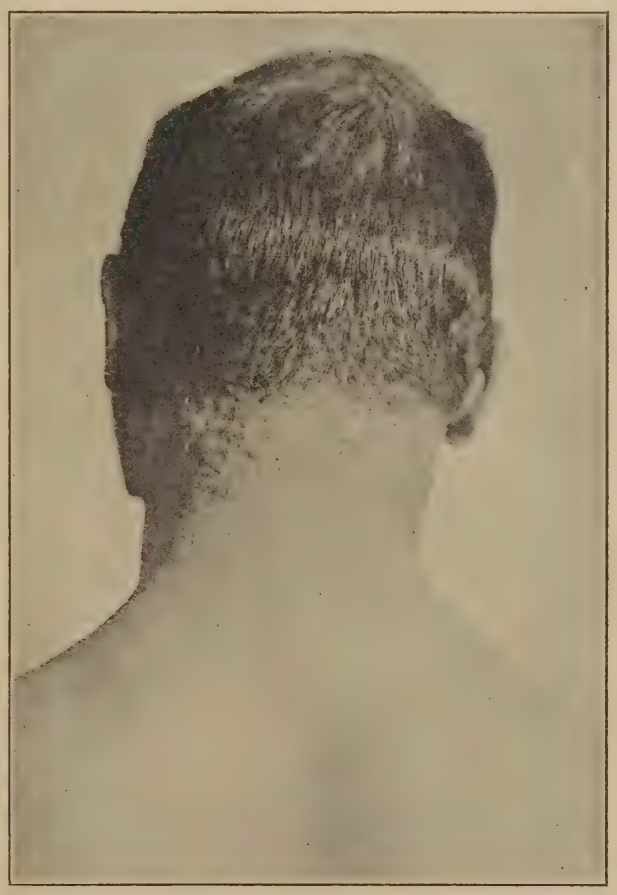

FIG. 4.—This was a severe case of acne indurata followed by keloidal lesions. Note destruction of hair follicles. Cured after twenty x ray treatments.

gist. Usually mild laxatives and carbohydrate free diets will suffice but occasionally it will be necessary to examine gastric contents and intestinal tract for the causation of chronic constipation and autointoxication. Ketron and King (14) a few years ago examined a series of thirty cases of acne vulgaris from the gastrointestinal point of view by means of test meals and fluoroscopic observations. They found that none of them gave absolutely normal findings and that sixty per cent. of the cases showed abnormalities which were of such nature as to permit gastric and intestinal stasis followed by toxic absorption. Recently, however, Ketron stated to us that he was not so sure the normal individual might not show the same findings.

What rôle the endocrine glands play in acne is undetermined. As Timme (15) states, "During the period following menstruation when the corpora lutea are formed, there is usually a diminished thyroid activity. As this period of luteal activity wanes and the next menstrual period approaches, the thyroid, presumably less opposed, becomes overactive and the nervousness, excitability and general mental uneasiness produced by thyroid activity becomes manifest." One might add to this that there is an accentuation of the acne and in the normal individual we often see the appearance of a few acneiform pustules during this period. As the French have pointed out there is an increased basal metabolism in hyperthyroidism and also in acne vulgaris during this period. We occasionally see acne confined to the chin in young women who give a history of irregular menstruation or dysmenorrhea. When such cases do not respond quickly to x rays or when the lesions recur one may administer ovarian gland with the purpose of balancing a hyperactive thyroid. In one of our cases of *acné mentonièrre* this type of therapy was successful when x rays failed completely. We do not advocate the indiscriminate administration of glandular therapy in acne but believe the future may be bright in this form of therapy.

In our series of cases of acne rosacea we have permanently cured ninety per cent. of our patients. Each patient presented the characteristic eruption which had lasted from three to ten years. We found in six patients a marked pyorrhea and abscess formation on devitalized teeth. One patient had a chronic sinusitis. One patient had dental abscesses and hyperchlorhydria. Two others presented simply hyperchlorhydria. One had a chronic prostatitis while in another the history and examination revealed nothing except a very rich diet. By proper treatment in the hands of specialists and x rays locally nine out of the ten cases were permanently cured. The acneiform lesions in the tenth case disappeared but the nose remained red. Some of this redness was removed by the destruction of superficial vessels with the electric needle. These results may illustrate how important it is to search for foci of infections.

Vaccine therapy apparently has had its day in acne. Howard Fox (5), who interrogated many of the leading dermatologists recently regarding vaccines in acne, came to the following conclusions: "Stock and autogenous vaccines are considered by the majority to be of equal efficiency. Whatever value these vaccines may possess is restricted to their use in selected cases, chiefly of the pustular type, or as an adjuvant to other methods of treatment. The action of vaccines is slow and improvement is often temporary. In the treatment of acne vulgaris, the röntgen ray is far superior to vaccines." We quite agree in so far as our experience goes with the foregoing summary. However, some of the early workers in this field cited some brilliant results from the use of vaccine. In the hands of these men, who were trained bacteriologists (16) as well as dermatologists, we do not believe that the efficacy of vaccine therapy can be entirely denied. However, the simplification of the method of the application of x rays and the limitation of its use to trained hands, has replaced vaccines and perhaps relegated them to the past.

Clinical type	*No. of cases*	*Average age years*	*Male*	*Female*	*Single*	*Married*	*Average No. of treatments*	*Cures*	*Recurrences*	*Cured after recurrence*	*Average number of treatments after recurrence*	*Not cured but improved*	*Remarks*
Comedone	11	18+	21	42	11	0	18	9	2	2	8	0	There was an almost total absence of comedones after x rays.
Papulopustule	35	18+	—	—	34	1	16	32	3	2	6	1	Cosmetic result very good.
Acne indurata	17	18+	—	—	15	2	18	15	2	2	8	0	Some scarring in all cases. Kromayer light with pressure improves this scarring.
Acné mentonnière induré profonde	7	22	0	7	5	2	14	6	1	—	8	1	Administration of ovarian gland caused disappearance of all lesions.
Acne rosacea	10	30+	3	7	4	6	16	9	1	—	6	1	Electric needle caused obliteration of venules but some redness remained.
Acne varioliformis	1	18	—	1	1	—	12	1	1	1	5	0	

SUMMARY

1. X rays are the most valuable therapeutic agent in acne.

2. Sequelæ in the hands of experienced men are practically nil.

3. For the best end results careful attention should be paid to focal infection, pathological disturbances, and dietary errors.

4. Vaccines are unnecessary (except in the occasional case) when irradiation is begun.

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The Significance of Heredity in Diseases of the Skin

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Heredity has long been known to be a factor in the etiology of certain cutaneous diseases and malformations but the practical aspects of the subject have been neglected to a great extent. Since James C. White delivered his paper on the "Hereditary Dermatoses" before the International Congress of Dermatology and Syphilis in Paris in 1889, studies and investigations have accumulated and have been analyzed in many cases to explain some of the phases of human heredity in dermatology.

The difficult problems of human heredity have been especially studied by Davenport, Morgan, Thomson, Popenoe and Johnson and many others. In ophthalmology, Nettleship and Howe should be mentioned; in psychiatry, Goddard, Rosanoff, Cotton and others; and in dermatology, Siemens, Stainer, Davenport and his coworkers.

Unfortunately civilization has interfered with the student of human heredity in many ways. The laws of heredity which apply so well to plants and animals meet opposition when conditions in man are studied. This is principally due to the limited size of families, the absence of brother and sister marriages, slow propagation, late maturity and the difficulty of securing reliable data. The first law of heredity, the phenomenon of "segregation of characters," if it could be applied to man, would add greatly to our knowledge of human inheritance. The Austrian monk, Mendel, showed in 1866 that when two opposite characters are crossed, only one of the characters appears in the offspring. This character is termed the dominant and the suppressed character the recessive. If the products of the first filial generation (hybrids) are mated, both characters will appear in the offspring, thus demonstrating the segregation of characters. It is here that the application of the Mendelian law meets opposition since it thus would necessitate the crossing of persons of the same parentage.

We must therefore depend upon other methods for ascertaining the inheritance of human characteristics. As Walter aptly states, "the consideration of human heredity must always be largely from the statistical side, consisting in an analysis of experiments already performed rather than in arbitrarily initiating new experiments." The results of these experiments are available in our large hospitals, clinics and institutions.

FACTORS RETARDING THE STUDY OF GENETICS IN MAN

There are several factors that modify and retard the study of genetics in man. Wells has recently stressed this subject in relation to the heredity of cancer. These adverse conditions may be classified as follows:

a. Unreliable family and ancestral histories.
b. The opportunity for error in the diagnosis of the attending physician.
c. The element of chance in the reappearance of a disease.
d. The inability to utilize plants and animals in this study.
e. The lack of control over human reproduction, mating and survival.
f. Inaccurate and missing birth records.
g. The inability to locate certain families and individuals.

IMPORTANCE OF HEREDITY IN CONGENITAL SKIN DISEASES

It is impossible to conceal the importance of heredity in the etiology of many congenital affections of the skin. While perhaps of more significance in psychiatry and ophthalmology, nevertheless, certain disfiguring affections of the skin, hair or nails may be the cause of great concern to the patient. Similar to what Howe has done in ophthalmology, the following data must be collected to aid the dermatologist in the application of heredity to his special field:

a. Compilation of a complete and modern bibliography.
b. Classification of titles according to diagnoses.
c. Addition of accurate family histories of skin defects.
d. Comparison of the relation of such tables with the Mendelian or other principles of heredity.
e. Stressing the importance of the differential diagnosis between those defects which are truly

hereditary and those which are due to infections.

f. Suggestions for measures to prevent or restrict the hereditary diseases.

HEREDITY IN DERMATOLOGY

During the last ten years there have been many contributors to the literature on the heredity of cutaneous diseases. Among these may be mentioned Meirowsky and Bruck and Siemens who have written on general discussions of the subject, Davenport and Preiser on neurofibromatosis, Dorothy Osborne on alopecia, Buchanan on protein sensitivity, Knowles on psoriasis and Levin, Maud Slye and Wells on carcinoma in general.

Among the conditions that have been shown to be transmitted as dominants may be mentioned the following: ichthyosis, keratosis palmaris et plantaris, multiple neurofibromatosis, monilethrix, ringed hair, gray locks, congenital alopecia, atrophia unguium and persistent hereditary telangiectasia.

Albinism, epidermolysis bullosa and carcinoma (in mice) appear to be transmitted as recessive characters. The heredity of psoriasis, acne, diseases due to protein sensitization, and the nevic types of malformations has not yet been completely worked out. The work of Siemens in his study of abnormalities in twins tends to disprove the assumption that birthmarks are inherited.

The inheritability of psoriasis has received considerable attention in the past although most dermatologists at present favor the parasitic or infectious theory as the cause of the disease. Psoriasis is a very common skin disease constituting from two to four per cent. of all cases. Stelwagon believes its frequent occurrence strengthens the parasitic theory while Ormsby states that there is an inherited predisposition in a number of cases although direct transmission of the disease has not yet been demonstrated.

MacLeod, an exponent of the microbic theory, also is convinced that an inherited predisposition to the disease exists, somewhat analogous to that which occurs in tuberculosis. The inheritance of a suitable soil for the growth of the unknown parasite may be a factor in many cases. Engman's report of fourteen cases in six generations is interesting from this viewpoint, although Knowles examined the histories of hundreds of cases and found only six instances of the familial type.

McNair has studied the heredity of rhus dermatitis and believes that resistance to the disease may be a dominant character. He has applied the Mendelian law to explain the appearance of high susceptibility in some families, immunity in others, varied susceptibility in individuals of one generation, immunity in one generation and susceptibility in the next.

Fasold has recently studied the heredity of xanthoma and finds it a dominant characteristic although the transmission is particularly irregular.

It is possible there is an inherited predisposition or constitutional state behind every disease controlling or modifying the type and extent of the pathological process as well as the resistance and susceptibility of the patient. Dermatologists have long recognized seborrhoic types of skin and the exudative diathesis. The French school of dermatology especially stresses constitutional types.

The internal secretions also may be involved in the complicated process of heredity. Thyroid therapy occasionally brings about improvement in certain cases of ichthyosis and nail diseases. Since the heredity of blood groups has been proven, certain states of the blood may be a factor in the production of certain hereditary skin diseases.

SUMMARY

1. Plant and animal experimentation is impossible in the study of human heredity so that investigations must largely be from the statistical side.

2. Certain disfiguring diseases of the skin that are hereditary should be studied more thoroughly from the viewpoint of genetics and eugenics.

3. A few diseases of the skin have already been classified as to their dominant or recessive characteristics.

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Case After Operation for Extensive Burn of the Left Lids, Eyeball, Upper Face and Temporal Area*

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On October 2, 1922, the patient, A. D., while leep in his room in a Pennsylvania city, was atcked and burned with carbolic acid. The fact that was not the person for whom it was intended did ot save him any of the discomfort. He was treated a local hospital, and afterwards, March 3, 1923, e came to the Post-Graduate Hospital, New York. On admission it was found that the face was much lcerated and extremely sensitive; the temporal area was still worse, the acid having destroyed the structures down to the bone; the hairy area on that side was destroyed, with foul smelling pus exuding; the eyeball was irreparably injured and hanging loose from its moorings; and the area about the lids was sloughing. Altogether a dreadful and seemingly hopeless condition.

Attention was first directed to combating the infection. By April 13, 1923, sufficient progress had been made to warrant the removal of the lid gland (done by Dr. Martin Cohen) and the repair of the eyelid by epithelial onlay. This operation was successful, function was restored to the lid and a good appearance resulted.

On May 5, 1923, the lower lid and upper face area were repaired by utilizing a supraorbital artery skin flap from the forehead, the upper border of the flap carrying a margin of forehead hair to replace the loss of the lower eyelashes.

On May 29th, repair of the temporal area was undertaken. A tubed flap from the scalp was brought to restore the destroyed hair area, and included with it was a section of skin from the nonhairy postauricular area for repair of the cheek. The patient's condition was not of the best for some time afterwards, and no other operation was performed until October 18th, when the supraorbital pedicle was re-

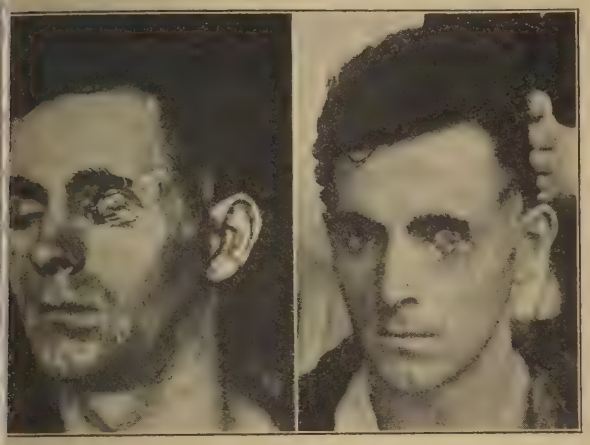

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 1.—Condition of patient upon admittance to Post Graduate Hospital, March 3, 1923.

Fig. 2.—Condition of patient after infection had been successfully combated.

Fig. 3.—Repair of upper eyelid by epithelial onlay. Repair of lower eyelid and eyelashes and upper face area by a supraorbital artery rehead flap including a margin of scalp hair.

Fig. 4.—Repair of the temporal area by a tube pedicle flap of scalp including the nonhairy skin area of the post auricular region.

Fig. 5

Fig. 6

Fig. 5.—Return of forehead and scalp flaps.

Fig. 6.—Side view showing result of repair of orbital ring, eyelids, face, and temporal area. The raw area of scalp and postauricular regions allowed to epithelize over, as patient was in no condition for further surgery.

Fig. 7.—Condition of patient when discharged from Post-graduate Hospital, November 27, 1923.

*Presented before the New York Academy of Medicine, Wednesday, March 26, 1924.

turned to the forehead. On October 26, 1923, enucleation of the eyeball was made by Dr. Cohen, and later on an artificial eye was inserted. On November 9, 1923, the scalp flap pedicle was returned, this being the fifth and final operation, during which the blood conditions occasioned some anxiety.

Healing was complete in December, 1923. The patient wrote, "I am as near my natural self as it is possible to get. I am at home feeling healthy and happy." Some time afterwards he returned to the occupation in which he had been engaged before the injury.

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Clinical Value of the Vasomotor Reflexes of the Skin*

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This communication, prepared primarily in answer to a recent criticism of Sampson Wright on a paper on "The Normal Reaction of the Skin to Stroking," published by me in 1916 (1), may also serve to draw attention to the diagnostic value of the vasomotor reflexes of the skin. Wright's paper, entitled "Some Observations on the Nature and Diagnostic Significance of the White Line of Sergent (*Ligne blanche surrenale*)," not only denied any pathological significance to the white line, but in addition would seem to have demolished the work reported in my 1916 paper, namely the phenomenon observed and described as the normal reaction of the skin to light stroking.

It is not so easy to kill two birds with one stone, and in attempting it a boomerang technic should be carefully avoided.

In his paper Wright states that he carefully followed the directions of Sergent in producing his white line, and the paper itself shows that he read Sergent's later communications (1921) on the subject. Had he treated my work as consistently, in the first place, he would have used the technic prescribed in Tracy's paper to get the phenomenon first recognized by him as the normal reaction of the skin to stroking (lightly); and second, he would have learned from the later communications that the white line has pathological significance.

1. Wright did not follow the prescribed technic, as the following excerpt from the paper he criticizes evidences. "The deduction that the phenomenon here described is the normal reaction of the skin to a mechanical irritant is based on the fact that it was observed in 1,165 out of 1,236 subjects examined. Their ages ranged from six days to eighty-three years. As there were known disease conditions in the majority of the remaining cases, it strengthens the deduction that the phenomenon under consideration is the normal reaction. The phenomenon in brief is this: When the skin of a normal quiescent subject is stroked by a wooden instrument (e. g., a wooden tongue depressor or a match) it reacts by a deepening of the skin tint, generally brief in duration, appearing where the stroke was made, or in its immediate vicinity, and then, after a period of fifteen seconds, by a longer lasting whitish color (in Caucasians), showing itself in the location where the stroke was made. The reaction is seen most clearly when the test is made for it on the rosy cheek of a healthy Caucasian boy or girl. The cheek is lightly stroked across once; its tint where stroked is soon seen to deepen, and, after fifteen or more seconds, a pallor takes the place of the redness, the streak of white being very noticeable because of its contrast with the rosy field upon which it is displayed. The normal reaction just described consists then of two components, the one, vasodilatation, and the other, vasoconstriction."

Wright (2) states in his paper: "I am unable to confirm Tracy's observations." Why? The reason is obvious on reading the following extract from his paper: "The technic adopted was as follows. After the clinical history had been taken, the subject was placed in a recumbent position for some minutes with the abdomen free, but lightly covered. A geometrical figure was then lightly traced on the skin of the abdomen with the round smooth end of a fountain pen. The directions of Sergent were closely followed. No pressure was exerted."

That the reaction from stroking the skin without pressure with the round smooth end of a fountain pen and the reaction obtained by stroking it lightly with a match or a wooden tongue depressor differ, any one will find by testing. The failure to use the prescribed technic accounts for Wright's failure to observe the beautiful reaction he would have seen had he stroked with a match the cheek of a healthy child, the reaction of brief vasodilatation followed by longer lasting vasoconstriction; a reaction also capable of verification by the careful observer.

May it be noted that notwithstanding Wright's "careful examination of the literature" one misses from his summary review the paper of M. Karasawa (Tokio) (3) in which this reaction to light stroking is described though not recognized as the *normal* reaction: "At the request of Th. Eserich," writes Karasawa, "I have sought the white line in healthy and diseased children. The test was made by stroking delicately the skin with a thin piece of metal. After a few seconds the skin became light red in the place stroked, then later (after ten to sixty seconds) in positive results the white line appeared. The reaction disappeared after three to six minutes." An additional item of interest is that Karasawa in his paper referred to a white line described by Bonchut in 1862, that antedates by thirteen years the earliest white line mentioned in Wright's paper, that of Vulpian, 1875.

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The failure of Wright to observe the phenomenon described in the writer's communication as the normal reaction to stroking the skin (lightly) is therefore readily explainable: he ignored the prescribed technic and used one unsuitable for the production of the phenomenon.

2. Wright did not follow up in the case of Tracy (as he did in the instance of Sergent) the work reported in later communications. In one such communication, "A Method of Testing the Vasomotor Reflexes of the Skin and of Recording the Same" (4), published in 1917, he would have read:

"All somatic phenomena are worthy of investigation and tabulation. In this way we learn to distinguish accurately what is normal from that which is abnormal. When certain abnormalities are found associated with certain disease conditions we are helped in the diagnosis of these conditions by the presence of the abnormalities.

"In studying the reactions in the peripheral bloodvessels caused by light stroking of the skin, I came to testing both sides of the face and both forearms (as these parts are readily accessible) and to record the findings in the time saving manner described below. In a normal person, when the skin is lightly stroked (with a pressure of about two ounces) there appears on the stroked surface a deepening of the skin tint lasting up to eight or twelve seconds, and then a white streak appears that lasts for a couple of minutes."

After describing the method of testing both sides of the face and both forearms, the paper continues as follows: "This method of testing the vasomotor reflexes was employed by the writer in the hope that the study of the phenomena in this systematic manner might lead to some useful result. Nor has the hope proved fruitless. A study of the reactions in normal and diseased individuals has already led to important findings of use in diagnosis. The method is offered to the clinician that tests may be made and recorded methodically in various diseases. A larger knowledge of the phenomena of the vasomotor reflex will thus result, etc."

Had Wright supplemented the reading of my first paper by a perusal of this communication printed in 1917, he would have seen that the use of a measured stimulus is insisted upon in passing. The more the subject is studied the more one recognizes the necessity of a measured stimulus in evoking the vasomotor reflexes of the skin, for the self evident reason that reactions vary with the amount of stimulus used to evoke them: unless a measured stimulus be used there is not identity of the phenomena under investigation. To the lack of a measured stimulus in evoking skin reactions is attributable, no doubt, the discordancy between observations made by different observers, and the controversy among clinicians over Sergent's white line.

When we measure the temperature of a patient, we do not rely upon our tactile sense, we use a thermometer. Likewise in measuring the pressure that serves as a stimulus in evoking the vasomotor reflexes of the skin, it is better to do so by means of an instrument, which in its very nature is devoid of the personal equation that inevitably accompanies the measurement of a stimulus by the tactile sense. A small spiral spring with a piece of a wooden tongue depressor inserted in one end has served the purpose admirably; it is so constructed that it evokes the reflexes with a measured stimulus approximating two ounces.

Although in my first paper no specific mention was made of a measured stimulus, as a matter of fact a stroke approximating two ounces had been employed. The discovery of the normal reaction to stroking the skin was the result of considerable investigation: the phenomena evoked even in normal subjects were so various that it was not until I hit upon a certain light stroking that the phenomena evoked in normal subjects were seen to be constant. This particular stroking when measured later, was found to be from two to two and a half ounces, and, realizing the necessity for specifying this amount of stimulus for scientific clinical work, its employment was specifically directed in after communications.

If the postulate be granted that a measured stimulus must be used in evoking skin reactions in order that these may have scientific value, it is difficult to see what value Wright's paper can have since unmeasured stimuli were used in producing the phenomena reported. That vasomotor reflexes evoked with a measured stimulus, certainly have important clinical value, two of my later communications were intended to demonstrate. One of them is devoted to the investigation of reflex vasodilatation, the first component of the normal reaction to stroking the skin; the other is a study of epilepsy, in the course of which the second component of the normal reaction, i. e., reflex vasoconstriction, or the white line, is shown to have pathological significance.

The first of these papers, entitled "The Red Streak: A Sign of Disease" (5), showed that reflex vasoconstriction (the first component of the normal reaction) evoked with a measured stimulus (two ounces pressure) when it lasted longer than fourteen seconds on the face, is pathognomonic, a sign of disease present in the individual tested, generally a purulent disease. Among the many disease conditions reported in which the "red streak" was found is mentioned cerebral meningitis, and Trousseau's famous diagnostic sign *la raie meningitique* is identified as a pronounced pathological lengthening of the reflex vasodilatation that is the first component of the normal reaction of the skin to stroking.

Another disease condition in which the red streak was found is socalled nervous or irritable heart. Since a part of the paper contains observations *evidencing* the involvement of the vegetative nervous system in the vasomotor reflexes (an involvement originally assumed to explain rationally the phenomena observed and reported) it is here copied:

"Functional heart cases, socalled nervous heart, are found associated with the red streak. Twelve cases were met with and tested. All gave the red streak. In four of these, the phenomenon of partial fading and intensifying of the streak, i. e., active systole and diastole of the peripheral bloodvessels, was visible. This phenomenon, so far as I am aware, has not been observed before; at least I have met with no account of it in the literature. In one case in which this phenomenon was noted, at the same time there were present reduplication of the heart sounds and irregularly acting heart. Some weeks after, on examining this case again, the red streak was present,

but the active systole and diastole of the vessels forming it were absent."

As regards the red streak with nervous heart disease, Lian (6) has made a similar observation: *"Coeur irritible—Symptomes connexes: Troubles vaso-moteurs. . . . Lorsqu'on explore la sensibilité du cou ou du tronc avec une épingle, on provoque, en general, l'apparition de petits points, ou de petites eleveurs rouges. La peau reagit d'une facon analogue si on trace une raie avec l'ongle."*

The second of the papers referred to, reporting the investigation of the second component of the normal reaction of the skin to stroking, i. e., reflex vasoconstriction, the white line, in the disease epilepsy, is entitled "Idiopathic Epilepsy a Sympathicopathy" (7) (a word coined, by the way, to signify the diseased condition of sympathetic fibres found in that disease). In that communication it is shown that the white line has pathological significance; that its abnormalities are such in epilepsy that they present objective signs of the presence of the disease. Based upon the systematic investigation heretofore alluded to, it was found that in normal individuals the reaction time for the white line (i. e., the time it takes for the white line to appear after stroking) is equal on opposite sides of the body; e. g., if it takes eight seconds for the white line to appear on the right forearm, the reaction time, eight seconds, is the same for the left forearm; and if it takes twelve seconds for the white line to appear on the right side of the face, the reaction time, twelve seconds, is the same for the left side of the face. In epilepsy, it has been found that the reaction times on opposite sides of the body are, as a rule, unequal, unbalanced. Normally, it was found that there is a relative steadiness in the reaction times of the white line, while in epilepsy there is a daily variation in the reaction times, at one time the white line coming quicker on the left side of the body, and at another time coming quicker on the right side. Moreover in no condition is there evokable a white line more intense or longer lasting than in epilepsy.

Enough has been shown to demonstrate the fallacy of Wright's sweeping conclusion that the white line "is without pathological significance," which, by the way, could hardly be determined by the "investigation of one hundred healthy individuals"—the extent of the clinical investigation which he reports.

The relation of the white line to adrenal insufficiency, as well as to other disease conditions, can be best worked out by clinicians using a measured stimulus, the importance of which is, as explained above, fundamental.

The connection of the white line with the suprarenals by Sergent has always appeared to me felicitous. Sergent tested a patient having many symptoms of meningitis for Trousseau's sign, *la raie méningitique,* and instead of it, the white line appeared. A few days after, at autopsy of the case, complete cheesy destruction of the suprarenals and no meningeal involvement was found. Hence the connection expressed by the term *la ligne blanche surrenale.* I have also connected the white line with the suprarenals, and more definitely still, i. e., with the hormone made by the medullary tissue of the suprarenals, adrenin. Based upon experimentation and clinical observations previously reported (1, 8), I regard reflex vasoconstriction, the white line, as due to nerve stimuli evoked by sensory stimulation, going inwards along sensory paths, and, in nerve centres where the reflex occurs, reflected outwards over vasoconstrictor fibres to the contractile tissue of the vessels involved in the reflex, together with a sufficiency of adrenalin in the blood stream; that is, to be brief, the action of nerve stimuli plus adrenalin equals vasoconstriction. Without adrenalin in sufficiency in the blood stream, no vasoconstriction.

In his paper, Wright states there is no available proof that adrenin has any action on the capillaries, I would offer the following: Place a drop of adrenalin solution on the skin, and pierce the epiderm, wet with the drop, with a few pin pricks. Soon enough will be seen an intensely white spot due to the osmosis of the adrenalin under the epiderm. The intensely anemic area is due to vasoconstriction of the capillaries therein, as determined by Krogh's (9) investigations (which showed that "clinical hyperemia and anemia are due mainly to changes in the calibre of the capillaries and in the number of open capillaries").

Besides this experiment, a clinical observation is offered: I once witnessed the onset of marked pallor in a patient after the introduction into his vein of a small quantity of adrenalin (before this method of medication was recognized as dangerous with adrenalin). The patient was not emotional; he suffered no ill consequences save a momentary distressful sensation in the region of the heart. The anemia of the skin observed directly following the addition of adrenalin to the blood stream in this case, can be regarded as due to the action of adrenalin on the capillaries of the skin, since Krogh has shown that clinical anemia in a tissue is the expression of the contracted capillaries in that tissue.

Wright further states that Sergent regards the white line as an "arteriole" phenomenon. The eminent clinician repeatedly uses the term *le spasme capillaire* in reference to the white line, and nowhere in his book *Etudes sur L'Insuffisance Surrenale,* editions of 1914 and 1921, do I find any allusion to it as an arteriole phenomenon.

SUMMARY

1. The evidence that the normal reaction to stroking the skin (lightly) is brief lasting vasodilatation followed by longer lasting vasoconstriction remains unimpaired by Sampson Wright: failing to use the prescribed technic, he missed the phenomenon. The phenomenon was observed by M. Karasawa (Tokio), using an appropriate technic.

2. A measured stimulus must be used in evoking the vasomotor reflexes of the skin if they are to have scientific value, for the reason that the reflexes vary with the amount of stimulus used, and unless a measured stimulus be employed there is not identity of the phenomena under investigation.

3. The vasomotor reflexes of the skin, evoked with a measured stimulus, are of clinical value, since reflex vasodilatation (the first component of the normal reaction to stroking the skin) when evoked with a measured stimulus approximating two ounces, has been shown to have pathological significance if on the face it lasts longer than fourteen seconds; and the white line, reflex vasoconstriction (the second

component of the normal reaction) has been shown to have pathological significance and normal characteristics, some of which have been reported.

4. The abnormal vasomotor reflexes, showing recurring active diastole and systole of the capillaries, observed in four cases associated with nervous and irregular heart action, evidence that the capillaries, like the heart, are controlled by the vegetative nervous system.

5. The hormone adrenin is shown to have an action on the capillaries, a vasoconstrictive action.

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The Present Status of Some of the More Common Dermatological Conditions

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In my college days, one of the professors characterized dermatology as follows: "Skin diseases are either eczema or not eczema and the treatment of both is the same." In the twenty odd years since, the subject of dermatology has made very rapid strides, keeping pace with the general progress of the age. Yet it is regarded very lightly by a large portion of the medical profession. Several of the more serious conditions have been incorporated in the textbooks on internal medicine on the plea that they are due to constitutional causes, among them being erysipelas, the purpura, herpes zoster, and several other dermatoses. As for the rest, it appears to be undignified on the part of our exalted profession to heed the suffering caused by such a vulgar discomfort as itching or the debility caused by marring of the personal appearance.

Aside from those mentioned above, there are numerous other dermatoses which originate from some disturbance within the system and are but symptoms of some general constitutional disease. Dermatological symptoms have the advantage of the visual picture which is more or less constant and it happens not infrequently that the dermatologist is the first to detect some obscure pathologic condition within the system. Early Addison's disease is a good example.

Even the reaction of the skin to external irritants is frequently dependent upon changes within the system. For example: chromophytosis can only be grafted upon a skin that has a special susceptibility for it. Blastomycosis is more common with patients who have high blood sugar. There is an individual susceptibility to poison ivy as well as to dermatitis from other causes. Microsporon ringworm heals spontaneously with the onset of puberty.

The popular belief that overfeeding with acids and condiments has something to do with causing certain dermatoses is clinically correct. It causes a disturbance in calcium metabolism and hyperacidity. The latter is known to be responsible for rosacea and herpes labialis. A diminution of the calcium content of the blood has been found to be nearly a constant accompaniment of a certain group of leg ulcers. Excellent results have been obtained from treating these patients with parathyroid, also from general and local applications of ultraviolet radiation which is known to have a definite and powerful effect on calcium metabolism.

Pruritus and eczema may accompany diabetes and nephritis or there may be evidence of a disturbance of kidney function without apparent kidney lesions. This will show itself in an increased chloride content and in nitrogen retention. The lesions in diabetes are most frequently located in the region of the genitals and the anus. They readily respond to diabetic diet and insulin medication. In some of the above mentioned diseases, as well as in urticaria, uricemia is found. This disturbance in purin metabolism appears to have a relation to the vegetative nervous system. They respond to atropin and cinchophen medication. Other cases of pruritus, eczema and urticaria are dependent upon vagotonus. They occur in patients with symptoms of the socalled vagotonic syndrome, such as asthma, hay fever, chronic conjunctivitis, and bradycardia. Hyperglycemia is usually present. The lesions as well as the hyperglycemia clear up under atropine.

Eczema occurring in the obese may depend upon either a disturbance in the thyroid or the pituitary. They can be differentiated by estimating the basal metabolism. The latter may be either increased or diminished in thyroid disease, but remains normal in cases with pituitary dysfunction. Many of these cases are due to protein anaphylaxis. Although there is no doubt that the latter is linked with the endocrine system, the manner in which it takes place is as yet not known. The instantaneous response of the exudative lesions, as well as attacks of asthma, to adrenalin medication speaks for its being due to endocrine disturbance.

The etiology of seborrheal dermatitis is still unknown. By some it is regarded as a bacterial infection. Several organisms have been blamed for its causation without any actual proof. On the other hand, in a majority of cases of that disease in children, a disturbance of fat digestion has been demonstrated and lately the same has been found in adults. There are other indications that this condition may be due to internal causes, namely—disturbances in

sugar and nitrogen metabolism. This is shown in the table below.

TABLE SHOWING RESULTS OF BLOOD CHEMISTRY IN SOME OF THE COMMON DERMATOSES[1]

Disease	No. of cases	Blood sugar in mgs.	Urea nitrogen in mgs.	Alkaline reserve in volumes of CO_2
Acute eczema	3	135	15.5	75
Chronic eczema	9	133	16	66
Chronic eczema	5	121	21.2	65.4
Sebor. dermatitis	8	146	16	67
Sebor. dermatitis	4	114	19.5	66.5
Simple acne	14	99	16.5	69
Pustular acne	17	145	15.2	65
Pruritus, urticaria	7	135	15.4	78
Psoriasis	8	130	19	67
Lupus erythemat	3	111	14	81
Scrophuloderma	9	110	18.5	53

[1]Figures indicate averages.

The blood was taken during the morning hours after a twelve hour fast from patients of the Lebanon and Bronx Hospital dispensaries and the laboratory work was done under the direction of Dr. S. Gitlow, director of the laboratory. The Ebstein and Folin methods were used for the sugar tests and the Van Slyke method for estimation of the alkaline reserve. Several interesting deductions can be made from the findings.

1. In some of the cases of eczema and seborrheal dermatitis there was a blood sugar content somewhat higher than that which is at present regarded as normal with a urea nitrogen within the normal limits, while in a smaller number of cases with a normal blood sugar there was a urea nitrogen content somewhat above the normal limits.

2. In simple acne the blood sugar content was within normal limits, while pustular acne yielded a sugar content well above the limits of normality, in agreement with the findings of many observers of a high sugar in all pustular skin diseases.

3. The alkaline reserve was within normal limits in practically all cases. This is in disagreement with the results obtained by Schwartz and Levine at Cornell, who found a lowered alkaline reserve in many cases of dermatitis and eczema. The discrepancy may perhaps be partly accounted for by the fact that the above mentioned workers had the blood taken in the afternoon and not after a period of rest and fasting.

From this brief résumé of the possible etiological causes of the above named group of very common dermatological conditions, one can readily see the difficulty in handling them. The subject of the interaction of the endocrines is not well understood. The response to the protein test is only about twenty per cent. certain. There are numerous other cases of eczema which are due to external irritants. For example, that occurring on the necks of women from wearing fur collars, and on the hands and arms from the Japanese lacquer on mah jong sets. There is a large group of trade eczemas, among them being the dermatoses occurring in dentists from the use of novocaine, in cement workers, in washerwomen, and in bakers and grocers from handling flour and sugar. To top this there is a group of very common dermatoses due to epidermophyton infection which is not readily differentiated from the eczema of other causes and in which the fungus is not readily demonstrated. Furthermore, skin inflammation which has existed for a long time may persist even after the cause has been eliminated. The process of finding and eliminating the cause is time consuming and often quite costly. The patient is interested primarily in being relieved from his suffering and is not willing to wait. It is fortunate, however, that we have certain means at our command that will at least temporarily cure eczema, although in many cases it is not possible to assure the patient that there will not be any recurrences.

Recently attempts have been made to desensitize the patient against protein anaphylaxis in general, without actually finding the particular protein at fault. This is done in one of two ways: either by giving him a small quantity of peptone half an hour before each meal or by injecting some foreign protein. The latter is administered in the form of sterile milk or in the form of a specially prepared protein, which has an advantage over milk in that it causes less severe reactions. The results so far obtained are quite promising.

Aside from finding and removing the cause, in acute eczema the management of the case is directed at first towards soothing the irritation and itching. This is best accomplished by the nightly bran bath, by soothing applications, and even wet dressings. The ultraviolet radiations from the quartz mercury lamp have a very beneficial influence in these cases. It should be applied to the point of a mild erythema every second day until the attack is under control. In cases of generalized acute eczema there are often several patches that refuse to yield and become chronic. They should subsequently be treated as such.

In chronic eczema when the disease is generalized we resort to stimulating medication such as salicylic acid and tar. The ultraviolet rays, however, will help clear up most of the cases. If the disease is more or less localized, x rays yield extremely gratifying results. One quarter of an erythema dose applied once a week will clear up the condition in from one to four applications.

The drugs commonly used in seborrheal dermatitis are resorcin and ammoniated mercury. Ultraviolet radiations from the air cooled quartz mercury lamp, however, act almost as a specific and will clear up an attack with but few exposures. This is equally true of the same condition in children.

In the limited scope of this paper it is not possible to touch even lightly upon all dermatological conditions due to internal causes. Two very common dermatoses must, however, be briefly mentioned. Psoriasis has been attributed to the thymus and is being treated with either extract of the gland or the stimulating doses of x rays applied to it. A small number of cures have been reported. Acne occurs at the onset of puberty. There are characteristic hair changes in this condition. In the male, the beard is sparse, while in the female there is usually hirsuties. There is a diminished sex appetite. All these symptoms point to the origin of the disease in a dysfunction of the gonads. My attention has recently been called to a number of patients who exhibited acne after pregnancy. These women asserted that they had a perfectly clear skin before that time. Others have noticed that acne, which had existed for a long time, disappeared with the occurrence of pregnancy. This further strengthens the possibility of its being of endocrine origin. Yet the results obtained from endocrine treatment are far from being brilliant.

One enthusiast of this method of treatment reports fifty per cent. cures. I doubt whether there are many that share this enthusiasm. On the other hand, x rays of medium hardness in one quarter doses applied once a week for a period of about ten weeks will result in a permanent cure in most of the cases.

SUMMARY AND CONCLUSIONS

Undoubtedly much has been accomplished toward putting dermatology on a rational basis by finding the cause of many conditions which, until quite recently, has been entirely obscure. Yet much obscurity still exists and it will require a great amount of effort on the part of the present and perhaps the future generation to clarify the field to such an extent as to make it possible to treat these conditions solely by eliminating the cause.

On the other hand, the results obtained from the application of physical therapy are so pronounced that no dermatologist can at this time afford to overlook this agent.

The x ray apparatus and the quartz mercury lamp are the most important agents in the armamentarium of the dermatologist of today.

1955 Grand Concourse.

Psoriasis Diffusa With Extensive Arthritis

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At the request of a visiting nurse, the following case of psoriasis diffusa, with extensive arthritis, was taken as a study, treated at my expense, hoping to be able to give some relief, for the patient's condition was pitiable.

Case.—The patient, a widow aged thirty-seven, a university graduate, formerly a school teacher, had been in good health until the age of twenty-six. She gave the following history:

In December, 1913, a dozen or more isolated spots of psoriasis appeared on chest and thighs, starting as a pimple and enlarging to an area half an inch in diameter, and lasting four or five weeks.

In December, 1914, a painful neuritis on the inner side of the left thigh confined her to her bed. An eruption of psoriasis started, reaching its height in a month, covering the scalp and much of the body; none on hands and feet. It was not very red and began to subside in March, 1915. The hair on her head grew again and was thick and dark brown in color. Arthritis had stiffened her knees.

Through the summer of 1915 there was no eruption, but the patient experienced some difficulty in ascending stairs from stiffened knees. She taught school from September to June, 1916.

In August, 1916, the eruption appeared on the scalp, the chest, and the arms, all being above the waist line, and it subsided in March, 1917. The patient's tonsils were removed in February, 1917. Arthritis had extended. In February, 1917, adhesions in knees, ankles and wrists were broken by force, and were broken again in September. There was no eruption throughout the summer of 1917.

In the fall of 1917 the eruption appeared, covering the scalp and much of the body nearly to the knees. This faded in July, 1918. In May, 1918, she was at a noted medical clinic where her eruption was pronounced the worst care of psoriasis they had seen.

Every fall since then the eruption has appeared, covering much of her body above the knees, subsiding in the spring or early summer, a few spots an inch and a half in diameter remaining. The hair of the scalp fell out, but came back quite thick.

The eruption of 1923 started early in the fall, fading by May, 1924. The patient's limbs were stiff and painful and she had not been able to feed herself since January. In April she menstruated, the first time for three years, also in June and first of July.

In July, 1924, her eruption started to spread. She was seen the last week in September. She had not walked for six years, nor had been able to turn on either side for nearly three years. Her joints had been very sore and painful for several months.

Every joint of her limbs was ankylosed. The distal ends of the first phalanx of the middle finger of both hands were dislocated towards the palm of hand. The fingers of the right hand were curved into the palm of the hand; the fingers of the left hand were straight. The finger nails were long, thick, yellow and curled to a point. On two fingers of the right hand a nail had grown backward and curled under itself. Both arms were so sensitive that the least movement of the pillow upon which they lay gave agonizing pain. The backs of both hands were edematous, pitting deeply on pressure. The knees were ankylosed in partial flexion, the tibias dislocated backward scarcely resting against the femurs, the hip joints so stiffened as to permit of only a half sitting posture. The ankles were greatly enlarged, and toenails thick, lumpy and of a yellowish color.

The eruption covered nearly her whole body, a larger area than ever before, starting earlier, the scales larger and thicker, the eruption a darker red, only her face entirely free from it. Her scalp, the back of the neck, extending into the ears, were completely covered. Her arms from shoulders to elbows were nearly covered and from elbows to finger tips completely covered; palms of hands only reddened. From above the breasts down to the soles of the feet, anterior and posterior, her body was completely covered, excepting the anterior third of the soles of the feet, where the skin was normal. All parts of the eruption seemed infiltrated. On the back of the neck, scalp, lower portion of abdomen, inner side of both thighs and both heels the eruption was purplish, the knees and forearms nearly so, the other parts a darker red than arterial blood.

Thick yellowish and dirty white scales, some over one inch by two inches, could be removed. They caused irritation, the visiting nurse removing daily

nearly a double handful of scales, a drop or two of blood showing where scales had not entirely loosened. The skin beneath the scales was shiny, looking as though it would bleed if touched. On the lower border of the right breast there was a warty excrescence four inches long, one inch wide, elevated half an inch, blackish color, dry, fissured like rough bark. There was a smaller one on each thigh at the gluteal fold. These came in the spring of 1924.

The patient could not be moved so that the back could be examined, as her limbs were too sensitive. Pulling the draw sheet from under her often brought tears to her eyes from the pain, the sheet coming out thick with large scales and a few drops of blood. Another sheet sprinkled with powdered boric acid and starch was pulled under her. The starch getting pasty, talcum proved better.

Not able to scratch herself, and too sore to permit others to do so, the itching was sometimes unbearable. Vomiting occurred frequently; some days she was not able to retain food, and at other times she had a good appetite and no distress after eating. Occasionally she was feverish in the evenings and sweat profusely, especially on those parts which rested on the bed, and on the inner side of thighs.

In previous attacks arsenic by mouth and muscular injection and the usual external applications had not shown benefit, and the patient would not consent to another trial of these remedies. Arsenic would not have corrected the systemic condition which seemed the probable cause of her attacks. External applications can be likened to mopping up a wet floor under a leaking roof. Psoriasis and pityriasis must be the expression of a systemic condition. Empirical methods are as shooting at game without taking sight, a hit would be a wonder, not likely to occur.

The hydrated oxide of calcium was given, as experience has convinced me it is far better than any of its salts, which have to be decomposed for the calcium to form organic compounds. And by improving digestion by the use of enzymes the calcium acted more quickly.

Parathyroid was given as it has been credited with "controlling the metabolism of calcium, preventing, removing, or destroying toxins in the blood." Reports have been made, that calcium by mouth does not prove beneficial until conjoined with parathyroid.

A half ounce of full strength aqua calcis was prescribed four times a day. She feared it would disturb her stomach, but at a vomiting spell the visiting nurse persuaded her to try it, a teaspoonful diluted every ten or fifteen minutes until vomiting and nausea stopped. It gave such quick relief she had the nurse telephone me her thanks for it. The calcium was then to be taken, half an ounce, diluted, four times a day. Her mouth secretions being strongly acid four grains of sodium hydroxide were added to half a pint of lime water. This was given for two or three days, then only the calcium was taken.

Improvement showed within three days, and in less than a week the edema of her hands had disappeared, and there was a decided fading of the eruption. In less than two weeks the purplish parts had faded to a lighter color than other parts had been, the whole eruption being much lighter color, the scales thinner and whiter, spots of clearing skin showing. There was no vomiting or night sweats. This much could be attributed to the calcium. In a few days enzymes were added to the treatment, to be taken at meals, the elixir of pepsin with one eighth of a diastase to increase the amylolytic action of the enzymes, as starches seem difficult for some to digest.

In about three weeks the back of her neck and scalp were normal in color, free from scales, the hair on her head scattering, almost bald on top. Large patches of clear skin showed everywhere, her breasts were nearly cleared. Small scales were falling, or were easily brushed off like a powder. Parathyroid extract, one tenth grain, three times a day, was added to the treatment.

In about five weeks the whole body was cleared of the eruption, excepting three small pale red spots, with no scales, just above the left iliac crest, and two similar spots on the back of the right shoulder. These spots have remained for at least three years.

In about six weeks the pain and soreness of her joints had left and by shoulder movement she wrote her name, the first time since early in January, 1924, she had been able to move either arm.

The soreness of her joints subsiding, this seems partly, if not wholly attributable to the enzymes acting by improving digestion, the food being more perfectly converted into substances that could be metabolized. There have been reports of benefit in arthritis from the use of yeast, which acts as enzymes aiding digestion, as in my experience from such enzymes as used in this case of psoriasis. In another case I should begin with the full treatment.

By the middle of December the patient's face showed plumpness, a clear skin with quite florid cheeks, a regaining of her former good looks, a great contrast to the sallowness of September. Her forearms were flexible to nearly a right angle. She menstruated in December the first time since July. Now, the middle of January, 1925, her body is clear of eruption, the spots above hip scarcely showing, the hair on her head is much thicker. The mouth secretions are alkaline, not beyond normal.

The history of this case, as in all cases of psoriasis, has been that the eruptions were at their height during fall and winter months, clearing towards spring, leaving a few small patches, returning the next fall. At no previous attack has her eruption cleared or faded as in this attack. This is the first December since 1915 that she has been free of an eruption covering much of her body. There are hopes that by enabling her to go through January and February free of eruption, which she has not done for the past eight years, the vicious cycle may be broken, at least a partial cure effected, preventing a return of a diffused form next fall. To accomplish this the treatment should be strictly carried out with the greatest care in order to demonstrate what it has given evidence of doing.

This case does not prove that the treatment will be effectual in all cases of psoriasis, though it seems to have been in this case, yet it is worthy of further trial which I hope others will test, for I may never have another opportunity to try it.

Radiotherapy in Dermatology

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For the treatment of surface lesions it is desirable to have a flat applicator containing the radium salt spread out so that the amount of radium per square centimetre of surface is the strength of the applicator. The full strength applicator contains five milligrams of radium to the square centimetre. However, for general dermatological use the half strength applicator containing ten milligrams of radium element is a most convenient device. With such an applicator it is easy to obtain the proper screening with either aluminum or brass and to measure the varied lengths of exposure for removing cosmetic blemishes.

There is no standard method of measuring the dose for the various cutaneous manifestations. The unit of measure is the millicurie hour which is equal to one millicurie of emanation applied for one hour or sixty millicuries for one minute. It is customary to express the strength of the radium used in millicuries of emanation or milligrams of radium element and the length of exposure depends entirely on the strength of the applicator, the distance from the skin, the density of the tissue treated, the extent of the surface covered and the character of the radiation.

The rays tend to stimulate or inhibit or destroy the growing property of cells and their reproductory capacities, especially in the case of embryological, gland and neoplastic or inflammatory cells. Cells differ in their susceptibility to radiation. The undifferentiated or embryonal cell is more susceptible, whereas the highly specialized type of cell is more resistant. Cells which are growing are of course more reactive than cells which are resting. Cells containing large amounts of chromatin, likewise, are more easily destroyed. Often the degree of malignancy of a tumor may be determined from a histological study of these factors before any dosage can be estimated. The endothelial lining of bloodvessels is very sensitive to radium and as a result, tumors having a great blood supply react more readily to radium than those with a scanty flow of blood. Tumors which have small amounts of connective tissue like epitheliomata and sarcomata are more radiosensitive than fibromata and organized keloids.

In dermatological practice it is noticed that lesions with acute inflammatory infiltrates of round cells are the least resistant and most readily reactive, as in simple dermatitis and eczema. Second to these in sensitivity to radiotherapy are the chronic inflammatory lesions which contain the connective tissue cells. Among the simple inflammatory lesions responsive to the radium rays are chronic eczema, psoriasis, neurodermatitis, patches of persistent seborrheic eczema, lichen planus and the prurigos. Tissues containing giant or plasma or epitheloid cells come third in their resistance to radiation; and, neoplastic cells, epithelial and glandular, are the most difficult to irradiate of any of the pathological cells. The normal tissue cells being in a resting state are more resistant than any of the pathological cells.

In inflammatory infiltrations like chronic eczema, lichen planus, psoriasis, radium has afforded a great deal of relief. In treating those lesions which are covered with crusts and scales it is first advisable to remove them by means of oily preparations and soothing bland wet dressings. The dose of radium should not be more than one or two milligram hours and a rubber filter is necessary. Treatment may be carried out by using one half strength glazed applicators screened with one tenth of a millimetre of brass or lead and weekly exposures of one half hour may be administered.

Granulomata which have yielded to radiotherapy are the leucemids, leucemic infiltrations, Hodgkin's disease and mycosis fungoides, and of course, while the rays cure the localized lesions they do not influence the general course of the particular condition.

Radium has also been valuable in infectious conditions like ringworm and favus of the scalp, tuberculous infections like lupus vulgaris, lupus erythematosus, tuberculosis verrucosa cutis and erythema induratum. Destructive doses, using one half strength applicators with one tenth of a millimetre screen of lead, applied for one or two hours at intervals of one week may be employed for tuberculous lesions.

Radium is indicated in neuroses of the skin like localized pruritis where the best method is by means of unscreened applicators, in three to five minute exposures repeated at intervals of one week. One third strength plaques may be used, screened with one tenth of a millimetre of aluminum for not more than fifty or sixty minutes in toto.

Among the benign tumors affected by radium are nævi and birthmarks. Small port wine birthmarks may be removed with one half strength applicators with light screening of either rubber or aluminum but the flat port wine marks do not yield readily to treatment. The cosmetic results obtained in the treatment of vascular nævi, however, are little short of magical. For the small lesions, the surface applicators of radium element are best and most convenient. One quarter strength applicators, unscreened, may be applied closely to the skin for a period of two hours at a time, at intervals of one week, or it may be applied for five hour periods if screened with one tenth millimetre of lead. However, for the vascular nævi which cover large areas, the best results are obtained by means of radium seeds because a greater area can thus be covered at one time. With the emanations the danger of exposing the normal skin to the rays is also greatly reduced.

Cavernous angiomata are readily affected by the gamma and beta rays and a full strength applicator may be used with a one tenth millimetre screen of lead. The dose of course depends upon the thickness of the vascular tissue but an exposure of no more than an hour or two should be given at one time. The deeper angiomata of course require the hardest, most penetrating rays, the gamma rays, and the best method is either by means of radium seeds or full strength applicators with brass filters which eliminate the hard beta rays. To avoid superficial irritations by the secondary rays which the gamma rays produce, the distance may be measured inasmuch as the

intensity of the radiation is in inverse proportion to the distance (although not exactly according to the inverse square law). The radium needles which may be conveniently embedded in such lesions may be left in the soft tissue for two hours or more without any destructive effect on the surrounding normal tissues.

Lymphangiomata which have been difficult to deal with in the past have yielded readily to radium.

Multiple benign cystic epitheliomata, situated as they usually are, on the face, and being difficult to treat, have been a great problem to the dermatologist inasmuch as before the use of radium it was almost impossible to obtain a good cosmetic effect. Often the cicatrices which formed were far more unsightly than the lesions themselves had been. In the treatment of these growths radium has acted miraculously, removing the lesions with no scarring.

The use of radium is especially indicated in small keloids and is to be preferred to the x rays. It is important in treating keloids to diagnose the lesion correctly and then to undertake treatment as early as possible. The extreme base of the lesion must be reached and treatment discontinued when no more palpable thickness is left. Best for small keloids is the one quarter to one half strength plaque with a screen of one tenth of a millimetre of brass, exposed for one or two hours. The result obtained is a smooth atrophic surface, soft and elastic and if proper filtering is used, the possible development of telangiectasias is avoided.

Painful plantar warts and callosities are easily and quickly removed with radium. Usually a one half strength plaque applied for from one half to two hours is sufficient to cause involution.

Radium has been a most valuable agent in precancerous affections like senile keratoses, Paget's disease, Darier's precancerous dyskeratosis, leucoplakia, xeroderma pigmentosum, and x ray keratoses. These potentially malignant conditions yield very readily to small doses of the element. The use of a one quarter strength applicator, unscreened for about one half hour to two hours, or screened with one tenth millimetre of lead for three to four hours is recommended. In the treatment of keratoses resulting from radiodermatitis, they should be considered as any other keratoses in nature, even though their origin was the röntgen rays. It is a most peculiar phenomenon that the soft beta rays of radium used in small doses will cure the keratoses produced by excessive doses of x rays.

Radiotherapy has proved of value in the malignant tumors of the skin like basal and prickle celled epitheliomata, lymphosarcoma and melanosarcoma. The dose varies with the character of the lesion, its clinical type and microscopic structure; and in these cases it is most important for the procedure to include simultaneous treatment of the anatomically related lymph nodes, with either radium or the x rays. In dealing with large, deeply infiltrated and ulcerated growths the gamma rays are most effective. It is often advisable in squamous celled epitheliomata to give an intensive dose of about two hundred millicuries, screened with two millimetres of brass at a distance of three centimetres for thirty hours in periods of ten or more hours each. This treatment in smaller doses might be repeated after about six weeks to two months if the disease persists and there are no signs of irritation by radium. In the treatment of basal celled epitheliomata radium is very important. As a matter of fact, this type of epithelioma is most amenable to the rays, and treatment of less intensity than that recommended for squamous celled epitheliomata is effective. Good results are often obtained by removing the tumor with endothermy and following the operation with radiotherapy.

In passing, it might be mentioned that radium is very effective for permanent depilation, but its use in hypertrichosis is not recommended by the writer, inasmuch as the development of atrophy and telangiectasias is inevitable, and rarely is it advisable to produce atrophy of the skin.

In the use of radium, the untoward clinical effects of the element upon the normal skin must be carefully watched for and guarded against. An inflammatory reaction known as radiodermatitis may come from a single intensive dose or may be the cumulative effect of several small doses, and it may be accompanied by subjective symptoms like burning, stinging, itching and possibly edema and swelling of the glands in the area treated. There may be some desquamation and pigmentation and the depilation of the area treated may be temporary or permanent. A more intense burn from radium may lead to superficial ulceration, beginning with a moist, exudative, eroded surface and leading to complete destruction of the epidermis. This type of ulceration sometimes will heal spontaneously, but when the necrosis caused by radium involves the true skin the ulcer may remain for years or persist indefinitely. A third degree burn from radium may give rise to dry, hard, necrosed masses like dry gangrene which eventually sloughs and gives rise to a deeply punched out ulcer, accompanied by excruciating pain.

Other unpleasant effects which the physicians must try to ward off are telangiectasias, cutaneous atrophy which appears in the form of fine wrinkling, pigmentation or depigmentation, the reduction of sebaceous activity and the development of keratoses and carcinomata.

In view of these possible disastrous effects of radiotherapy, it is of utmost importance that great care and skill be exercised in the application of the chemical to the human body. It is of utmost importance, likewise, that the physician be thoroughly acquainted with the microscopic nature of the particular lesions to be treated and the chemical nature of the element. He must also learn to recognize the beginning of the untoward symptoms and regulate his doses accordingly.

In conclusion, there is nothing more to say than that radium seems to be the method of choice in the treatment of numerous skin affections, particularly in those which involve a thickening of the tissue as in cases of granulomas, vascular nævi, verrucous growths, keloids, and a tendency to malignancy as in epitheliomata and sarcomata. However, much harm can be done if the radium is used promiscuously and blindly. The physician must be able to interpret the lesions in terms of their particular structure and pathology, and be acquainted with the methods of regulating doses carefully, for while radium is one of the most powerful therapeutic agents, it is also one of the most dangerous.

Historical Medicine

Remarks on the Hygiene of the Ancient Greeks

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Gymnastic exercises of every description were unquestionably carried to the highest perfection among the ancient Greeks. Their love of physical exercise influenced their art, health, and genius, and they understood it far better than we do today. Contrary to presentday teachings, their school children did not at once specialize in a given exercise or sport. Every child was obliged to learn at least five, viz., running, jumping, throwing the disc and spear, and wrestling. The sounds of the flute regulated the movements, while the master superintended all, ready to correct any breach of the rules.

Since dislocations and fractures frequently occurred in the palestra, the professors of gymnastics were surgeons as well, or at least were bonesetters. They even went further, because in 500 B. C. they had already applied gymnastics to the treatment of disease. Precursor of the Swedish, a master of a gymnasium, one Herodicus, himself of weakly constitution, corrected his feeble health by regular exercise and following his example arthritic and frail subjects derived health from these means.

The Greeks well knew the untoward results accruing from the abuse of sports. Hippocrates mentions them and Galen further developed the question in his exhortation for the study of the arts. However, at the time Galen lived, the Romans had given up sports in favor of professionals and it is curious to compare the brute types of athletes appearing in the Roman circus with the harmonious types of Greek statuary.

The Greeks developed the hygiene of alimentation; it was part of the treatment of disease and many books of the Hippocratic collection are devoted to this subject. That compared with our times the Greeks were more sober in the use of alcohol is not to be doubted, but the people loved their wine and the mental excitement derived therefrom they deified in the person of Bacchus accompanied by Silenus and satyrs. During their orgiastic festivals, wine gave prophetic inspiration to the bacchantes. There were inveterate drunkards as well, because Asclepiades attributes congestion and sclerosis of the liver to *oenophilia,* while Hippocrates has described delirium tremens.

The ancient Greek physicians condemned the use of alcohol and advised an early walk. In cases of fever they ordered an abundant intake of fluids and allowed no solid food. In Plutarch's time mixed or highly spiced foods were condemned by the medical profession. All these rules form the basis of the alimentary hygiene of today, but the goddess Hygeia who presides over them does not receive the worship to which she is entitled.

When patients who had come to consult the priests had passed through the propyleums of Asclepieion at Epindaurus, they came face to face with an inscription in large letters: Absolute Cleanliness.

The organization of life in the open in ancient Greece is an interesting study. Under the *stoai* (porticos) which were built in the meanest village, the Greeks not only walked and amused themselves, but also kept school and meeted out justice. With the same interest in hygiene, the planting of trees was a constant anxiety of urban architects. Of this we have the testimony of contemporary writers who dwell upon the profusion of trees and plants at Athens, especially platanes, the olive trees of Megara and the public places of Chalcis transformed into forests. Certain public monuments were even hidden by this abundant foliage.

Even today, with our housekeeping and other material difficulties of living, the intellectual classes have envisaged the possibility of creating garden cities in the suburbs of large cities, reserved for artists, etc., even as the Athenian philosophers and poets were installed over an area of some two square miles lying between Ilissos and the Cephesis. Students came to dwell among them and were lodged in humble thatched huts of wood, and there alternated bodily exercises with those of the mind, in the sovereign calm of the Attic countryside. A vegetarian diet was highly *a la mode* then just as it is at the present time, honey enjoying a great reputation as a valuable food.

The physicians of those distant days prided themselves upon their superior intellectual culture which even Plato was compelled to acknowledge. Not content with palpating painful shins or searching for the causes of distressing symptoms, they philosophized with their patients, and in reality, is not this the principal secret of successful physicians today, and which in numberless cases is more effective than pills and compressed tablets?

The study of the texts and paintings on vases reveal the fact that the ancient Greeks were well skilled in hydrotherapy and knew full well the virtues of sea bathing quite as much as those of the shower bath. The municipal authorities organized public baths. Sunbaths and hot air baths were much in vogue. Thermal sources had their clientele and the rule in every well ordered house was to offer a bath to guests in order to relieve them of the dust of travel, and likewise to dispose them for the pleasures of the table.

Every dwelling, even modest ones, had a bath house containing one or several bathing tubs, situated without, close by the terrace. In the homeric times, baths were taken in *asaminths,* large shallow marble or silver vessels, while later on vast tubs, supported on pedestals, were used. Partial bathing, especially of the feet, was common in the homeric period. This duty, as well as the care of the bath in general for visitors, was incumbent upon the servants, and upon special occasions Penelope confided this care to her old nurse as a mark of respect to some sage

and elderly foreigner. The servant poured water upon the visitor from a jar over the head and shoulders, but the elegant ladies of those days, probably anxious to protect the undulation of their hair, put on a cap when they took a bath. There were also bathing pools where swimming could be practised.

The public baths were supplied with masseurs, and a kind of soap (*rhymmata*) as well as perfumes, could be obtained. The ancient Greeks built sanatoria and building around them was prohibited. And this leads to the question of the architectural principles of the times which reveal a constant care for proper ventilation and favorable sites for building. The roofs were flat and the occupants of the house often sat or slept on them. The windows were left open during sleep.

Moreover, the Ediles kept the city clean. Athens had her drains and sewers, although these were not novel, since Nineveh long before had superb ones. Strabo is wrong when he accuses the Greeks of having neglected the laying down of paved streets, and not to have constructed sewers and aqueducts. A very original point in the construction of the great sewer of Athens is referred to by Mr. Guillaume in his article entitled Cloaca, in the *Dictionnaire des Antiquités Grecques et Romaines.* Its end terminated in a reservoir from which brick conduits carried off the contents, distributing them in open country outside the city.

Let us now briefly consider the theories of epidemics held by the Greeks, and here Prof. E. Jeanselme's opinion should be quoted. "To affirm that all the means employed by modern hygiene were known to the Greeks and that the progress of science has merely developed the principles conceived by Greek minds is an exaggerated assertion." This remark of Jeanselme unquestionably is true, but at the same time one should endeavor to ascertain exactly what we really do owe to the Greeks. When one speaks of Hellenic culture it is treated in dithyrambic praise, but only generalities are discussed.

The first agent of contagion devised by man was the devil. It was because the demon entered into the body and possessed it that caused man to fall ill. Treatment consisted of exorcism. Later on, when mankind conceived the idea of gods, it attributed disease—as well as all other ills—to wicked gods. And when the gods disappeared from his mentality, man believed that disease was caused by the one just God, who thus punished human beings for their errors.

But with the advent of Hippocrates all this changed. In paragraph 24, of *Air, Water, and Places,* it is stated that "Every disease has a natural cause, and cannot be produced without a natural cause." This sums up the opinion of the learned of the time. But the people believed that epilepsy and convulsions were caused by divine power, hence the name *morbus sacer* given to them. In his treatise on the *Sacred Disease,* Hippocrates proves that this is likewise due to natural causes and that the supernatural should be eliminated from medicine.

This was an enormous step forward, but of the natural causes of disease and epidemic maladies in particular, the Greeks were ignorant, and the centuries after them were likewise ignorant. The theory accepted by physicians was that of miasmata and at length their truth was proved by the immortal Pasteur by scientific demonstration. The theory of miasmatic contagion consequently was not devoid of a basis, because the ancients well knew that the atmosphere exhaled by decomposing matter, such as sewerage, was fatal, and that certain soils, such as the Dogs' Grotto near Naples, give off lethal or deleterious vapors which were finally shown to be carbonic acid. Therefore, their theory is not entirely erroneous, but they made the mistake of generalizing it, so that it at length became erroneous from a too general application.

Maimonides on Sexual Laws in the Old Testament

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In chapter forty-nine of *The Guide of the Perplexed,* that repository of philosophical wisdom by Maimonides, are found several references to the laws of forbidden sexual intercourse as proscribed in the Old Testament. Although the notations of the great physician and reformer of the twelfth century in this regard are somewhat concise they are none the less filled with a highly moral significance, and are clear and decisive in their import.

"The Law," Maimonides says, "seeks in all its parts to inculcate the lesson that we ought to limit sexual intercourse altogether, and hold it in contempt, and only desire it very rarely." He is here, no doubt, speaking against the prevailing gross tendencies of the period, for he insists that the object of the bans was not merely to diminish carnal relationship, but "to teach that such enjoyment is in itself not the final cause."

There is a brief mention made of the evils of homosexuality and bestiality. "The prohibition of pederasty and carnal intercourse with beasts is very clear." He then refers the reader to Leviticus XVIII, 22, which specifies: "Thou shalt not lie with mankind as with womankind. It is an abomination." Further (*ibid* 23), "Thou shalt not lie with any beast to defile thyself therewith; neither shall any woman stand before a beast, to lie down thereto; it is perversion."

"If in the natural way," the *Guide* states, "the act is too base to be performed except when needed, how much more base is it if performed in an unnatural way and only for the sake of pleasure?"

Of incest he remarks: "License between the root and the branch, between a man and his mother or her daughter is outrageous." Leviticus XVIII goes into much detail on this score, enumerating the various possibilities of this relationship, and admonishing vigorously against them: "None of you shall approach to any that is near of kin to him, to uncover their nakedness." The members of the household being constantly in association with the head of the family would easily listen and yield to him. He could thus without difficulty procure them.

"It makes no difference," he adds, "whether the male element is the root or the branch." And also "we must not indulge in any sensual enjoyment whatever with persons included in the above prohibition." We must not even look at them if we intend to derive such pleasure from them. This is obviously a very stringent rule to follow.

Advice against onanism is offered in a practical way. "We must not engage our thoughts with acts of cohabitation, or irritate the organ of generation. When we find ourselves in a state of irritation we must turn our minds to other thoughts." He quotes from the sages of old who warned: "My son, if that monster meets you, drag it in the house of study. It will melt if it is of iron, it will break in pieces if it is of stone."

"See how properly the term monster is used," Maimonides comments, "for that irritation is indeed like a monster."

How similar is the counsel of the physician Rondibilis (in Osler's *Principles and Practice of Medicine,* 8th edition, page 278) who told Panurge that carnal concupiscence could be cooled and quelled by hard work of body and mind.

Another way of avoiding the stirring up of sexual ideas, we are told, is to refrain from watching birds and beasts in the act of copulation. This is one reason, Maimonides believed, for the law against cross-breeding of animals (Leviticus XIX, 19).

He interprets the inauguration of the practice of circumcision as a means not only of solidifying a race by giving it a mark of identification, but of "limiting sexual intercourse, weakening the organ of generation, and moderating man." It is performed, then, not as a "complement to a deficient physical creation, but for perfecting man's moral shortcomings."

This reasoning, however, is not consistent with Genesis I, 22, which commands the race to "be fruitful and multiply." One readily discerns in these commentaries of the Dark Ages a Puritanical undercurrent which is far removed from the liberal interpretations of today.

Contributors to the Science of Medicine

William Budd

William Budd, practitioner of medicine, careful student and logical thinker in the science of epidemiology, was born in September, 1811, in North Tawton, a town on the borders of the beautiful Dartmoor in Devonshire, England. He was the fifth son of Samuel Budd, being one of nine brothers, seven of whom entered the medical profession and became leading practitioners. The family was one of great talent. Five sons were graduated from Cambridge. Four of these were fellows of their respective colleges, and all were wranglers. Four of Dr. William Budd's nephews likewise became fellows of colleges in the same university. Both Dr. William Budd and his older brother, Dr. George Budd, the author of the great work on *Diseases of the Liver,* were fellows of the Royal Society.

With his eight brothers, William Budd was educated in the home of his father, himself a surgeon of no mean ability. In 1827, when he was sixteen years of age, he went to Paris. There he studied for four years under Louis Andral, Cruvelhier and Broussais in the College de France and the Ecole de Médecine, and, under the tuition of Broussais, first became acquainted with the intestinal lesions of typhoid fever. While in Paris he contracted typhoid, and the leeching and starvation, which was the accepted treatment of the disease at that time, was carried to such a point that he was unable to pursue his studies for several years. In spite of this, he valued bleeding very highly in the early part of his career. Returning from Paris, he continued his medical studies in London and Edinburgh, and subsequently became a pupil of Sir Thomas Watson at the Middlesex Hospital. This is the "Sir T. Watson, Bart.," to whom Budd dedicated his *opus magnum, Typhoid Fever, Its Nature, Mode of Spreading and Prevention,* "in grateful remembrance of many encouraging words."

In 1838 Budd took the M.D. degree from the University of Edinburgh and after graduation he served for a short time as physician to the seamen's hospital ship *Dreadnaught* at Greenwich, but was compelled to resign his post because of an attack of typhus fever of which he almost died. In 1839, during his convalescence, he resided with his brother, Dr. Richard Budd, of Barnstaple, and prepared an essay on *Fever,* in competition for the Warneford prize of £50. He failed to receive the award, however, because the judges, of whom Sir John Forbes was umpire, were of the opinion that the ideas enunciated in his essay were "too novel and startling."

In 1839 Budd returned to North Tawton and entered into practice with his father, and here began those intensive studies which were to be the basis of his work on *Typhoid Fever, Its Nature, Mode of Spreading and Prevention,* published over thirty years later. In this environment Budd was able to study the disease in all its manifestations and to

correlate the going and the coming of those who were affected with it. He realized fully the opportunities which the situation offered, and wrote many years later:

"Where the question at issue is that of the propagation of disease by human intercourse, rural districts, where the population is thin, and the lines of intercourse are few and always easily traced, offer opportunities for its settlement which are not to be met with in the crowded haunts of large towns."

As a result of his observations at this time he came to the conclusion that the fever was essentially a contagious or selfpropagated disease.

Not only did Budd decide that the disease was contagious, but he came to the conclusion that it was of a specific nature. And in 1873 he clearly prophesied the existence of the bacillus which was not discovered until some seven or eight years later. He said:

"It is humilitating to think that issues such as these should be contingent on the powers of a creature so low in the scale of being that the mildew which springs up on decaying wood must be considered high in comparison."

He also came to the conclusion, from the foregoing, that typhoid fever not only propagates itself, but that it propagates no other kind of fever.

In the course of his studies—studies which he never relinquished until forced by the hand of age—he early came to the very logical conclusion that the pollution of water supplies was the great factor in typhoid transmission. In fact, Budd recognized all the media of transmission now known, with the possible exception of flies. In his work on typhoid he says:

"One mode of communication has attracted little attention, which it is important, nevertheless, not to overlook; I speak of the tainted hands of those who wait on the sick. Among the poor, and in ways that will suggest themselves, and need not be more particularly described, there is reason to believe that this mode often has a large share in spreading the disease through the family circle. Passing from the hand to other things under contingencies that are not only very conceivable, but are sure now and then to occur, the contagion thus arising may sometimes have a much wider scope. I possess evidence which renders it in the highest degree probable that milk and butter, especially, may become infected in this way."

As preventive measures, Budd at all times laid strong emphasis on the disinfection of the discharges of the sick, the isolation of all typhoid patients, the careful and frequent washing of the hands of the attendant, and the boiling of the drinking water. Truly, as he says, "These are golden rules; where they are neglected the fever may become a deadly scourge; where they are strictly carried out, it seldom spreads beyond the person first attacked."

Budd's lasting contribution to the science of epidemiology may best be summed up in the summary of his book on typhoid fever. Other researches he made, to be sure, but many of these were contingent on his typhoid studies; studies which brought us nearer to the absolute prevention and eradication of this disease than the work of any other observer, either before or since his time. It, therefore, seems fitting that the words which closed the *opus magnum* of his life, words which in reality closed the book of his scientific labors, should be the final chapter in this story of that pioneer epidemiologist, William Budd. The labors of a lifetime, and the ambitions of his career, are summed up in the following propositions:

"1. That typhoid fever is in its essence, a contagious or selfpropagating fever, and is a member of the great natural family of contagious fevers, of which smallpox may be taken to be the type.

"2. That the living body of the infected man is the soil in which the specific poison, which is the cause of the fever, breeds and multiplies.

"3. That the reproduction of this poison in the infected body and the disturbance attaching to it constitute the fever.

"4. That this reproduction is the same in kind as that of which we have, in smallpox, ocular demonstration.

"5. That the disease of the intestine, which is its distinctive anatomical mark, is the specific eruption of the fever, and bears the same pathological relation to it which the smallpox eruption bears to smallpox.

"6. That, as might have been anticipated from this view, the contagious matter by which the fever is propagated is cast off, chiefly, in the discharge from the diseased intestine.

"7. That, as a necessary result, sewers and the cloacæ which, under existing sanitary arrangements, are the common receptacles of these discharges, are also the principal instruments in the transmission of the contagion; and, consequently, that in many instances the infected sewer, and not the infected man, appears as if it were the primary source of the specific poison.

"8. That once cast off by the intestine, this poison may communicate the fever to other persons in two principal ways—either by contaminating the drinking water, or by infecting the air.

"9. That, as an inevitable consequence of the impalpable minuteness of the contagious unit, and the many invisible and untraceable ways in which it is transmitted, cases must be constantly occurring, exactly as in the other contagious fevers, whose linear descent cannot be followed, and which spring up, therefore, under the semblance of spontaneous origin.

"10. That the occurrence of such cases obviously constitutes no proof whatever that this fever ever does arise spontaneously.

"11. That the exceeding speciality of the conditions attaching to the reproduction of the specific poison in the living body itself, as well as the facts relating to the geographical distribution, past and present, of this and the other contagious fevers, constitute evidence as strong as such evidence can ever be that none of these fevers originate spontaneously, but are propagated solely by the law of continuous succession.

"And lastly—to crown the whole induction by a practical test—that by destroying the infective power of the intestinal discharges, by strong chemicals or otherwise, the spread of the fever may be entirely prevented, and that by repeating this process in every fresh case as it arises the disease may in time be finally extinguished.

"And let no one suppose that this is a matter in which he has no personal interest. The duty itself we may evade, but we can never be sure of evading the penalties of its neglect. This disease not seldom attacks the rich, but it thrives most among the poor. But by reason of our common humanity we are all, whether rich or poor, more nearly related here than we are apt to think. The members of the great human family are, in fact, bound together by a thousand secret ties, of whose existence the world in general little dreams.

"And he that was never yet connected with his poorer neighbor, by deeds of charity or love, may one day find, when it is too late, that he is connected with him by a bond which may bring them both, at once, to a common grave."

The Study of the Pulse.—Dr. William Shainline Middleton, in his article on "A Biographical History of Physical Diagnosis," appearing in *The Annals of Medical History,* for December, 1924, says: "The study of the pulse was neglected by physicians until Herophilus of Alexandria (335-280 B.C.). No mention of the pulse is found in the works of Hippocrates. Galen, however, established a system of medicine on the minutiæ of pulse variations.

"The accurate timing of the pulse may be traced to Galileo Galilei (1564-1642), although Sanctorius is incorrectly credited with this contribution to medical science. Born in Pisa of a noble though impecunious Florentime family, Galileo was gifted with brilliant intellect, mechanical ingenuity and assiduous application. His father, a prominent mathematician and musician, endeavored to guide his son's training to more remunerative fields. After a preparatory course in Latin and Greek at the monastery of Valombrosa, Galileo entered upon the study of medicine in his eighteenth year under the renowned Andrea Cesalpino (1524-1603) at the University of Pisa. The immortal observation of a bronze lamp swinging in the duomo at Pisa was but one of a series of mechanical discoveries which insidiously drew his master mind from the field of medicine into astronomy and experimental philosophy.

"However, this fundamental discovery of the isochronism of the pendulum was first timed by the young medical student with his own pulse and fifty years later he remarked of his astronomical clock, 'My clock will not vary so much as the beat of a pulse. Galileo applied the term, 'pulsilogon' to his invention. Medicine did not immediately avail itself of the obvious advantages of the pulsilogon. Another astronomer, Herman Kepler, wrote in the year 1618:

" 'In a healthy man, robust and of full age, in one of melancholic complexion, or in a feeble man, generally for each second there is a pulsation of the artery, with no discrimination between systole and diastole; thus there should be in one minute sixty pulsations, but this slowness is rare, commonly 70 may be counted, and in the fullblooded and in women 80, four to each three seconds. Briefly, in one hour 4,000, more or less.'

"Sydenham did not mention the pulse rate and Harvey (1578-1657) spoke of it but once. Morgagni (1682-1771) recorded the first example of heart block (Stokes-Adams syndrome) with a pulse of 22 in 'the sixtieth of an hour.' In 1707 Sir John Floyer dedicated 'The Physician's Pulse Watch' to Queen Anne with the patronizing air of a Steele, 'for without health we should have no relish even for the extraordinary blessings of your reign.' The watch described ran for sixty seconds. The text contains some very important observations, but the innovation was greeted with derision by the profession at large. S. Weir Mitchell aptly characterized the state of medicine in the eighteenth century: 'It is observation gone minutely made; a whole Lilliput of symptoms; an exasperating waste of human intelligence.'

"From the extreme overzealousness of Heberden (1710-1801) in pulse study, one passes to the complete ignoring of the pulse rate by Corvisart. To Louis and the Dublin school must go the credit of the routine pulse determination at a period two hundred years removed from the medically neglected discovery of Galileo."

Bark as a Drug.—William Macmichael in his book, *The Gold Headed Cane,* gives an interesting account of the discovery and early use of bark as medicine.

A number of cinchona trees, he writes, were thrown into a pool in Peru and lay there till the water became so bitter that everyone refused to drink it. One of the neighboring inhabitants was suddenly seized one day with a violent paroxysm of fever, and, finding no other water to quench his thirst, was forced to drink from the bitter pool, "by which he was perfectly cured." He afterwards told some of his friends who were ill with fever and they made use of the same remedy, which again proved successful. "But it was not only the casual experience of an uncivilized people which discovered this valuable remedy, but the first prejudices against its use, which were very strong, were counteracted by the influence of a religious sect (the Jesuits), totally unconnected with the practice of medicine; and physicians were ultimately taught how to use it with effect by a man who was vilified both at home and abroad as an ignorant empiric."

Sydenham, when speaking of the use of bark as a medicine, is very contradictory in his statements and seems to have been afraid to employ it efficiently, and it was not till Louis XIV. bought the secret of the method of giving it that the real virtues of the drug were properly felt and universally acknowledged. Talbor was the name of the man from whom Louis bought the secret, and while his cure of the King was in progress, Madame de Sévigné describes in a letter most amusingly the anxiety over it of every one at court, and the fury of M. D'Aquin, first physician to the King. Talbor was knighted but died the year after he had triumphantly exhibited his skill in the curing of Louis. The King then ordered the secret to be published for the benefit of mankind.

The same monarch introduced ipecac into general practice, having induced Helvetius to use it largely for the cure of dysentery in 1679.

Editorial Articles

EDUCATION BY DEPARTMENTS OF HEALTH

It is interesting these days to scan the weekly or monthly bulletin of the departments of health in different cities and to make comparisons, not only of these with each other, but of the general nature of all of them with health reports of a decade or two ago.

The very existence of the bulletin of a health department is worth considering. If we are right, such a piece of literature has not existed long, though there have, of course, been annual health reports for some time back, and the bulletins as they now exist grew out of this. Some of these documents have not, in fact, progressed greatly beyond the stage of the annual statistical returns issued now in weekly or monthly installments. One of such reports which we open is half made up of vital statistics of births and deaths. Now vital statistics are well enough in their way, but in the weekly way, except in epidemics, they signify almost nothing, and even a monthly rate means little to the average, even professional, reader. It certainly does not make anybody any healthier. Another city does better in offering its socalled normal rate besides its current rate of sickness and death. The Health Officer of this city is certainly frank, for among other normal rates is that for smallpox. In the first mentioned bulletin there is also a list of health supply stations, some remarks on the typhoid oyster situation and on what one division of the health department is doing. The bulletin is excellent in its way, but it is evidently intended primarily for the members of the department and, to some extent, the physicians of the city. Probably its circulation is chiefly limited to these. The layman would certainly find it of little interest and no benefit.

A bulletin of another city contains, in the same number of pages as the preceding, effects of influenza on the general death rate, new milk regulations, the health play, what should a school child's lunch consist of? school rooms should be carefully ventilated, queries and answers, food suggestions, crossword health puzzle and measles. Perhaps half of these articles appeal to, and are written for, the laity.

A bulletin from still another city is devoted almost entirely to the subject of dress. It is intended altogether for the laity, except one page devoted to a quarterly report on typhoid fever. This bulletin may be said to represent the latest type of public health work, the education of the layman in personal and community hygiene. The first bulletin stands for the work of the department of a quarter century ago, while the second belongs to a transition period. It is interesting to note that in the bulletin which still lays emphasis on sanitation, the print is the smallest and there are no pictures; while in the third bulletin, devoted to informing the general public on matters of health, the type is much larger and there are attractive illustrations.

Now in the departments of health of all three of these cities much the same routine of laboratory work, sanitary inspection, isolation for communicable disease, etc., is going on, and one department is as efficient as the others, but the bulletin which represents the most up to date service reflects the present condition of affairs so far as real progress is concerned. Until further advance is made in the prevention of communicable disease and other laboratory discoveries in connection with illness, the chief business of the department of public health, aside from routine left over from the last century, is the educating of the laity to an appreciation and practice of what is now known concerning the laws of community and personal health. Someone should do this, and why not the department of health? The physician can do his important share by word of mouth, but the health authorities have a better opportunity for broadcasting through the printed page.

THE NATURE AND TREATMENT OF DISEASE

Empiricism in medicine still flourishes and it continues to flourish because empirical treatment is found effective frequently, although the originating cause of disease may be so extremely obscure as to be practically unknown. As a matter of fact the discovery of the causal organism of a disease does not appear to assist greatly in its successful treatment. If it did so assist why has not pulmonary tuberculosis been almost extinguished seeing that Koch's discovery took place more than forty years ago. Moreover, it is pointed out editorially in the *Lancet*, January 3, 1925, that in spite of Laveran's discovery of the malarial parasite in 1880, the value of cinchona bark as an empirical remedy was known and utilized more than two hundred years before.

There are indeed many examples of the efficacy of empirical treatment, a treatment which clinical experience has demonstrated on innumerable occasions to be effective. Little is known of the exact manner in which many drugs do their work, although

they have or appear to have a distinct action in curtailing the inroads of a disease or in modifying its virulence.

Disease is largely a question of whether the defenses of the body are in a strong enough condition to resist successfully the attacks of the enemy. If the body is healthy such attacks come to naught and if the defensive powers are at a low ebb they are successful in proportion to the diminished strength of the defenses. Also, the old belief that inherited diathesis has something, perhaps much, to do with the progress of certain chronic diseases seems again to be coming to the front. Inherited predisposition may be a factor of considerable importance and it may be the case that the sins of the fathers are visited upon the children more often than is generally supposed. Sir James Mackenzie has for long both preached and practised that symptoms are too frequently treated and that insufficient care is exercised in finding out the originating causes of a malady and that minor ailments are considered too casually by both doctor and patient, with the result that these ailments become serious and sometimes lapse into chronic conditions. The rheumatic diseases, socalled, exemplify these views in the most striking way.

In order to cope with disease effectively earnest and early cooperation between the medical man and the patient is absolutely necessary and the situation as regards cancer affords sinister testimony to the truth of this statement. Cancer in all its forms is amenable to treatment in its early stages, and a main reason why it is so deadly is because, as a rule, it is not diagnosed early enough for treatment to be of much avail. Education of the public is required not only as to the beginnings of cancer but of most of the chronic diseases, and of the necessity for consulting a physician before it is too late.

As far as therapeutic treatment is concerned, the view that drugs exert a directly inhibitive or destructive effect on the invading organism is waning. With respect to the action of quinine on the malarial parasite, its rapid disappearance, as shown by experimental evidence, almost negatives the theory that it exerts destructive effects on the plasmodia. Rather it must be believed that it directly or indirectly stimulates the defensive mechanism of the body to organize to destroy the malarial organism or impair its potency. And so it is probably with the majority of human maladies.

Progress is being made in the direction of more precise knowledge of the nature of disease, and it is likely that advance will be comparatively rapid while effective treatment will be equally rapid if not more rapid, as treatment is not wholly dependent on the knowledge of the cause of disease. It may be predicted that this year long strides will be made towards the goal which all medical men are endeavoring to reach, namely, the discovery of the nature of disease and the ideal treatment.

DECREASE IN MALARIA IN THE CANAL ZONE

During the first ten years of American occupation of the Canal Zone, the average rate of malaria among employees on the Panama Canal was 293 in one thousand workers; for the ten year period, just ended—the second of American occupation—the rate was twenty-eight in one thousand, and for the year 1923 the rate was nineteen in one thousand. A summary of the report of the health department is given in a recent number of the *Panama Canal Record*. This report states that the greater part of present day malaria among employees occurs in colored laborers, including the transient, the occasionally employed, and those whose work requires residence or exposure in unsanitated areas. Dr. Henry R. Carter, assistant surgeon general of the United States Public Health Service, who recently inspected the work in the Zone, stated that at the time of his service there, in reconstruction days, about 1904-1909, a rate of two per cent. of employees a week—more than a hundred per cent. a year—was considered a fair standard of malaria control for the locality, and that the present rate of less than two per cent. a year was then considered an utter impossibility.

The report goes on to describe the intensive work recently undertaken by the Division of Sanitation, much of which is not apparent to the casual eye, as was the case when efforts were confined largely to residential sections. About five years ago the Health Department intensified its program of malaria prevention and elimination by permanent filling or draining of nearby mosquito breeding areas, thus making unnecessary the oft repeated work of cleaning out ditches, oiling puddles, cutting grass, inspecting premises, etc. "The drain, buried in the earth and unnoticed by the passerby, often took the place of the oil or larvacide man, and the black smear along the roadside. . . . At the same time, similar methods of permanent control by filling and draining were adopted in other more distant sections, with the result that extensive breeding areas which were formerly entirely neglected have now been completely eliminated. Within a general radius of one mile from the borders of the Zone towns and terminal cities, no mosquito breeding whatever is tolerated. Where danger appears to threaten from areas as far as two miles distant (and even further in case of the large swamps on the Atlantic coast) drainage is

being instituted to control the development of mosquitoes."

The sanitary forces are being gradually reduced in numbers, a step which has become possible through the change from temporary to permanent measures of control. The cost of sanitation is being correspondingly reduced.

The Division of Sanitation is now chiefly concerned, aside from its efforts against malaria, with preventing the introduction of bubonic plague from South or Central American seaports. The report says: "As a result of painstaking work by the sanitary forces and of splendid cooperative efforts made by other departments or divisions of the Panama Canal, the terminal cities and towns are approaching a condition which would render the spread of plague most unlikely, even if a human case or an infected rat were introduced from some vessel. Many thousands of infected rats are caught each year and examined in the health department laboratory to determine if the germ of the plague is present. Ratproofing of structures is steadily progressing. No case of human plague and no infected rat has been known to exist in the Zone since 1905, in which year two colored laborers contracted the disease at La Boca and died. A thorough antirodent campaign in the infected area wiped out the focus of infection. With the Canal now in operation, it is important to remember that the development of a single case of plague locally, or the finding of a plague infected rat, would cost the Canal and commerce an almost unlimited sum of money in quarantine restrictions and efforts at eradication."

BLOOD, URIC ACID, GOUT AND SKIN AFFECTIONS

While there is no belief nowadays that diseases are directly inherited, the belief in the inheritance of a diathesis or predisposition to a disease appears to be rather gaining than losing ground. Of all these diatheses that of uric acid seems to be the one with regard to the heredity of which medical opinion is the most confirmed. As for gout, the evidence in support of its being a hereditary disease is very strong, that is, the predisposition to it and the disease may lie latent until it is evoked into activity by other causes. The connection between gout and uric acid is by no means so obvious as might be supposed. After it had been demonstrated that the blood of gouty persons contained uric acid in abnormal quantities, the hypothesis that uric acid played an essential part in its causation seemed proved. Further investigations have shown that the problem is not so simple as was thought at first. In cases of gout it is true that there is usually a considerable increase in the amount of uric acid in the blood, but uric acid may also be increased in other diseases distinct from gout, in severe cases of nephritis, for instance.

Therefore, the increase in the uric acid in the blood is not pathognomonic of gout, although it is extremely suggestive of it. The most striking evidence in favor of uric acid being the chief factor in the development of gout is that diet in which purin bodies predominate will delay the excretion of uric acid in a gouty patient and bring on an attack and that careful dieting and measures to eliminate uric acid from the system will relieve an attack. The uric acid predisposition or diathesis provides the soil and gout merely signifies that the goutiness or latent condition has been aroused to activity. That there is a very intimate relationship between the presence in the body of an excess of uric acid and gout and goutiness cannot be denied although the exact relationship is not quite obvious.

With regard to blood uric acid in skin diseases, some remarkably interesting experimental investigations have been made recently by Dr. Jay Frank Schamberg, director, and Mr. Herman Brown, chemist of the Research Institute of Cutaneous Medicine, Philadelphia. Dr. Schamberg and Mr. Brown presented a paper before the American Dermatological Association on the blood uric acid in diseases of the skin with particular reference to eczema and pruritus. This article was published in the *American Journal of Dermatology and Syphilology,* December, 1923.

The authors pointed out that there was a tendency on the part of American writers on dermatology to pay little or no attention to the relationship of gout and eczema, which had always been emphasized by French dermatologists and, to some extent, by skin specialists in Great Britain, especially by Pilbury Fox. Although there is no unanimity as to what constitutes the maximum normal for uric acid in the blood, Schamberg and Brown hold that it is about three and seven tenths mg. per hundred c. c. of blood; estimated by this standard forty-four per cent. of their 161 cases of eczema and fifty per cent. of ten cases of pruritus showed an excess of uric acid in the blood. Other skin diseases showed a lower percentage. These findings are instructive and are in keeping with those of the leading French dermatologists.

This paper suggests another point which is worthy of notice, namely, that American medical literature on gout is scanty. French physicians are the most voluminous writers on the subject, while among British writers Garrod and Llewellyn have made clear certain obscure features. Gout is more rare in this country than in Europe. Also, the type of the disease has altered considerably everywhere, and the acute, explosive, excruciatingly painful form

is seldom met with nowadays. In some countries what is known as rheumatic gout is common and goutiness or susceptibility to the disease is prevalent in this country, if not so often seen as in certain parts of Europe.

Goutiness manifests itself in many and various ways which, as it is due to insufficient or perverted metabolism leading either to the formation of material which is foreign to a healthy condition or to the inadequate discharge of normal excretion and elimination, cannot be wondered at. There is a something foreign in the blood, which, in its endeavors to find an outlet, may attack any organ or tissue and the form assumed will depend upon the organ or tissue selected or which refers the best opportunity for escape of the alien body. The poison or foreign something may attack the neighborhood of joints bringing about a chronic gouty arthritis; it may take refuge in the sheaths of nerves causing a neuritis. As said before, it may cause skin diseases. It may make the air passages the sphere of its noxious activity and cause pharyngitis, laryngitis, bronchitis, or asthma. It may turn its attention to the stomach and induce dyspepsia. It may choose the brain and give rise to irritability, sleepiness, and sluggishness. It may bring on a cystitis, pyelitis, and perhaps even a urethritis. No part of the body can claim freedom from invasion of the uric acid poison. It has been suggested, and quite plausibly, that the underlying cause of these manifestations, largely due to an excess of uric acid in the system, is an imbalance of the endocrine glands. It may be further suggested that in many instances this imbalance is owing to chronic intestinal toxemia brought about by prolonged gastrointestinal disorders, the chief of which is constipation.

The sequence of events may be somewhat as follows: Obstinate constipation followed by intestinal stasis and ending in alimentary toxemia, one or other of the endocrine glands has its functions impeded and there is a lack of the usual harmonious team work between these glands which results in an upset of the system, disordered metabolism, uric acid forms in abnormal quantities in those predisposed and any of the gouty or socalled rheumatic manifestations are likely to ensue. If in a gouty patient there is delay in the excretion of uric acid one of two things has occurred, the diminution in the uric acid output may be due to an increased destruction in the body or to its retention by the kidneys. As there is no evidence of increased destruction in the body, the conclusion is reasonable that it is retained by the kidneys. The most clearly indicated method of treatment is to prevent an attack of gout or allied affections from coming to a crisis by the promotion of free diuresis. If uric acid has collected in the kidneys in such amounts as to hamper their proper working, the obvious method of effective treatment is to promote free diuresis. In all diseases practically adequate elimination and excretion are essential to complete recovery. In gouty conditions and the like in which the urinary tract is involved, this method of treatment is especially necessary. Careful diet is the first prerequisite, but some means of relieving the kidneys of the foreign substance or substances which clog them are also called for.

REFORM IN RONTGENOLOGY

The field of röntgenology is a fertile one for the charlatan. Steps have already been taken by various communities—New York city among them—to meet this evil, but much more is to be done than the passage of laws requiring the licensing of röntgen laboratories.

The American Journal of Röntgenology and Radium Therapy has recently made a plea through its editorial columns for the inauguration of a crusade for reform in the field of röntgenology similar to that undertaken by the American Medical Association in the field of drugs. The journal purposes to have a "column" in which information and suggestions along these lines will appear. A request is made for advertisements, circulars and general information from all legitimate sources about practitioners of röntgenology who should not be practising.

Such a step toward a needed reform should receive the cooperation of all selfrespecting practitioners of medicine.

AMERICAN HEART ASSOCIATION ANNUAL MEETING

The first annual meeting of the American Heart Association was held at the New York Academy of Medicine, Monday afternoon, February 2, 1925. Dr. Lewis A. Conner, the president, reviewed briefly the progress of the development of the association and commented on the need for such an organization and the widespread interest which its formation had developed. Dr. Haven Emerson, chairman of the committee on membership, described the methods employed to reach all parts of the United States and Canada; regional agents covering one or more states have been appointed and already thirty-seven states are represented in the membership of the association. The following program for the coming year was adopted:

1. Maintenance of a central office. As a headquarters through which all the work of the association may be organized and directed. This office is already established but the personnel must be increased to keep pace with the demands which are increasing daily.

2. Organization and membership. One of the first and most important steps in the development of the organization of the association is that of securing contacts with all parts of the United States and Canada. This is to be accomplished by appointing regional representatives and obtaining a large and widely distributed membership.

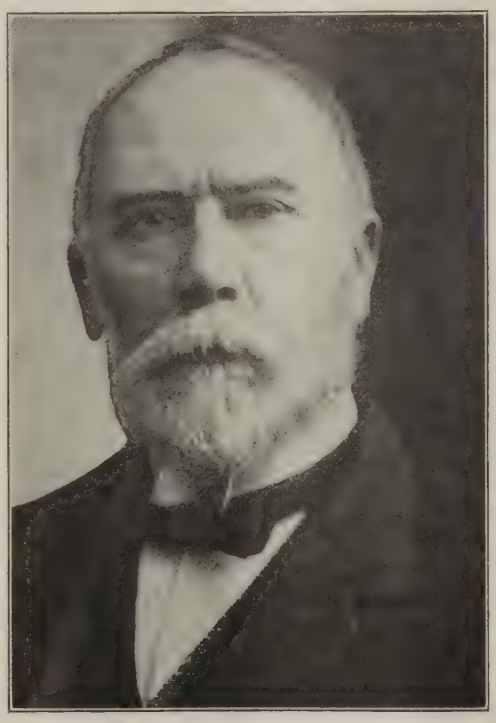
3. Field work. One or more workers with a knowledge of the most recent and approved methods for the prevention of heart disease and the organized care of cardiac patients, who shall be available to be sent to different sections of the country to encourage the establishment of new centres, demonstrate the methods found to be effective, and aid in solving local problems as they arise.

Obituary.

SIR JAMES MACKENZIE, M.D., F.R.S., F.R.C.P.

St. Andrews, Scotland

Pioneers of medical science may be counted almost on the fingers, and in the death of Sir James Mackenzie one of these pioneers has just passed away. The life of the man who revolutionized the study and treatment of heart disease is a romance of medicine. A graduate of medicine of Edinburgh University he went to Burnley, a busy, smoky, cotton spinning Lancashire town, as a general practitioner in 1879, and found like most men of commanding talent find and acknowledge, that they are profoundly ignorant in many respects. But unlike the majority of general practitioners who are content to follow tradition and routine, Mackenzie possessed the inquisitiveness of the searcher after truth and the perseverance and grit to pursue investigations under immense difficulties. He felt impelled to dissipate some of the ignorance which beset him and directed his attention to unravelling some of the problems of symptoms. The average general practitioner in an industrial district has quite enough to do to cope with the ordinary work, but Mackenzie made his general practice the field of persistent and painstaking research. As a matter of fact he planned one of the most stupendous tasks of research work ever thought of which involved the collecting and tabulating of thousands of individual records and consequently an amount of labor impossible to the ordinary man. Of course, Mackenzie was not an ordinary man, rather a genius who solved problems that had baffled the most skillful clinicians for ages, and his surpassing achievements in the realms of cardiology were even more fully acknowledged in other countries than in his own.



SIR JAMES MACKENZIE

For twenty years his labors continued without lagging and at the end of that time he had accumulated such a mass of knowledge and had broken so much new ground, that when he published his famous book with it all in, he fairly took the medical world by storm. His book was quickly published in most of the European languages and indeed he had established a new school of cardiology. He was more than fifty years old when he came to London but his reputation was made and he came into consulting practice under favorable auspices. Lord Knutsford, chairman of the London Hospital, that large institution situated in the poorest district of the metropolis, was his staunch friend and through his influence Mackenzie was given wards in the London Hospital. He had also become physician to the Mount Vernon Hospital for Diseases of the Chest and the work done there and at the London Hospital corroborated the accuracy of Mackenzie's early deductions while at the same time it afforded him scope to widen his field of knowledge. By this time, as said before, a school had arisen with the former Burnley general practitioner as its founder.

The outbreak of war interrupted his studies, although by this time he had formed a large and lucrative consulting practice. However, his aim was to trace disease to its secret lairs rather than to treat it and as he was convinced that study and treatment would be at a standstill until the general practitioner became a research worker, because the general practitioner alone sees the earliest signs of disease, he set himself, at the height of his fame to resume the work begun in Lancashire and in collaboration with general practitioners to probe the secrets of the origin of disease. For this purpose he betook himself to St. Andrews "the grey o'd toon by the sea" in his native Scotland where he gathered round him the general practitioners of the place to work with him. They eagerly assented and the greatest medical scientific figure of the day, the man whom his fellow men of all lands had delighted to honor, foregathered with family doctors in the endeavor to lift the veil which obscured the mystery of disease yet a little higher. While it is too early to pass any definite opinion on the value of the work done in St. Andrews, those who were most closely in touch affirm that very considerable progress was made.

Mackenzie's view of treatment was of a preventive nature, that complaints if treated in time, would be prevented from developing into grave disease and his object in St. Andrews was to learn more of the beginnings of disease. Of Sir James Mackenzie's contribution to the world's knowledge of the heart no terms of eulogy can be too high. He blazed the trail and is said to have acknowledged that although he had made a few discoveries in connection with the heart the trail was only blazed. After all, it is the pioneer who bears the heat and burden of the day who is of the greatest account and Mackenzie's name will be linked with the great

names of medicine as the most famous cardiologist in that he pointed the way.

It is one of the ironies of fate that the man who was an acknowledged authority on heart disease should fall a victim to angina pectoris. Sir James was seventy-one years of age. He was knighted in 1915 and elected F.R.S. the following year. He was LL.D. of Aberdeen and Edinburgh Universities and a few weeks ago was awarded the Charles Mickle Fellowship Prize of the University of Toronto as a recognition of his labors for medicine and medical science.

He was Oliver Sharpley lecturer to the Royal College of Physicians and Schorstein lecturer at the London Hospital in 1911 and Gibson Memorial lecturer at Edinburgh in 1914. His publications included *Study of the Pulse, Diseases of the Heart, Symptoms and Their Interpretations,* and *Principles of the Diagnosis and Treatment of Heart Affections.* In illustration of the habit of mind of Sir James Mackenzie, some years ago the writer called on him to ask for a paper from him for an American medical journal. When he had made his request Dr. Mackenzie, as he was then, said, "I never write, Sir, unless I have something to say," and when he was interrogated as to whether he had nothing to say at the time, he answered "Nothing." He did not rush into print for the sake of writing but only wrote when he felt that what he had to say should be made public for the sake of humanity and in the cause of science. Sir James Mackenzie returned from his work at St. Andrews only a few months ago, and died in London on January 26, 1925.

JOHN HUNTER, M.D.

SYDNEY, AUSTRALIA

The sudden death of Dr. John Hunter from enteric fever which occurred at the London University College Hospital on December 10th, comes as a tragedy to modern scientific medicine. He delivered the John B. Murphy lecture in surgery at the New York meeting of the Clinical Congress of the American College of Surgeons on October 20th.

Although Dr. Hunter was only twenty-seven years of age, he had made for himself a notable place both as a teacher and a scientific investigator, particularly in anatomy. Perhaps his most notable work, and that for which he is best known in this country, was that in connection with Dr. N. D. Royle on spastic paralysis, which created unusual interest among surgeons, orthopedists and neurologists of the world.

John Hunter was born in 1898 at Bendigo, State of Victoria. Throughout his infancy he was threatened with being a cripple, but his mother left no stone unturned in her efforts to obtain the best corrective treatment for him, and he was finally saved by surgery. Thus at the early age of seven, he became interested in this branch of medicine. The expenses of his treatment had completely depleted the family income and savings, so that most of his boyhood and youth were of necessity devoted almost exclusively to supporting himself and his mother; but, as one of his biographers has said, "instead of becoming depressed by his early struggles, he seemed to get added zest for the joy of life from the feeling that he had surmounted difficulties; he was a most delightful and joyful companion and it was amazing that, in spite of the adulation showered upon him by students and the public, he always remained the most modest and unassuming of men."

In the course of his early years, he had a bad attack of pneumonia which induced his mother to take him to live with an aunt in New South Wales, Australia, where he spent the rest of his life, and where he came under the influence of Prof. J. T. Wilson, now of Cambridge, who supervised his scientific and social interests and studies. He was graduated from the University of Sydney in 1920 with the highest honors in his class and the university medal. Upon his graduation he was appointed senior demonstrator of anatomy, acting as resident of the Royal Prince Alfred Hospital during vacations. When, a few months later, Wilson was appointed to the chair of anatomy at Cambridge, he saw to it that Hunter was put in the way of succeeding him, and within a short time the young man, at the age of twenty-three, was made professor of anatomy. Before he assumed his duties, it was considered advisable for him to tour Europe and America for observation and study, and it was while making this tour that he contracted the infection which caused his death.

As has been said, probably Hunter's most notable work, and his most recent, was with spastic paralysis, but before he left Australia, he had cleared up many of the difficulties in the interpretation of ovarian pregnancy, in the real significance of the occurrence of Neanderthaloid characters in Australians, and in analyzing the complicated factors of spinal shock following transverse section of the spinal cord. While he was in the United States and Canada, he gave demonstrations and lectures in many of the medical centres of both countries. He then went to England to expound the outcome of his work and was taken ill the week he was to demonstrate. His death occurred after a brief illness.

One of his colleagues has written: "To those who have come under the spell of his genius and learned the truth of the teaching for which he has given his life, it must remain ever a duty and privilege to expound his work in the effort to convince others of its truth and to extend its applications by experiment and clinical application." Prof. G. Elliot Smith has said, that, had Hunter been spared, he would have been perhaps "the biggest figure in scientific medicine of the present generation."

News Items.

Harvey Society Lecture.—Dr. Oscar M. Schloss, professor of pediatrics, Cornell University Medical School, will deliver the seventh Harvey Society Lecture at the New York Academy of Medicine, on Saturday evening, March 21, 1925. His subject will be The Intestinal Absorption of Antigenic Protein in Infancy.

Neurological Research Committee.—The Commissioner of Health of New York has called together a committee to study the epidemiological, diagnostic, clinical, and therapeutic data in relation to diseases of the nervous system. Dr. Charles L. Dana was elected chairman, and the other members are: Dr. W. W. Browning, Dr. Dever S. Byard, Mr. E. H. Lewinski-Corwin, Dr. Louis I. Harris, Dr. Howard Mason, Dr. William H. Park, Dr. Frederick Tilney, Dr. E. G. Zabriskie, and exofficio, Dr. Frank J. Monaghan, health commissioner.

Dr. Madill Honored.—The St. Lawrence County Society of New York held its annual dinner at the Hotel Astor, February 19th, with Dr. Grant C. Madill, former president of the Medical Society of the State of New York, as guest of honor.

Teaching of Stomatology.—The New York Polyclinic Medical School and Hospital has established a section of stomatology, in connection with its department of gastroenterology. Alfred J. Asgis, D.D.S. has been appointed clinical professor of stomatology.

The Smoke Nuisance.—Dr. Herman S. Peck, deputy health commissioner of Brooklyn, is taking active interest in the campaign for the suppression of smoke. Section 211 of the sanitary code of New York City is directed against unnecessary smoke.

Clinic for Speech Defects.—A clinic for speech defects has been established by the department of public speaking of New York University, Washington Square. Serious cases will receive the cooperation of the New York University Medical College and Flower Hospital.

Postgraduate Courses.—The medical school of the University of California is arranging courses in general medicine and surgery, and numerous specialities, under the direction of Dr. Eugene S. Kilgore of San Francisco, to be given June 15 to July 11, at San Francisco.

Noble Wiley Jones Lectures.—Dr. Anton J. Carlson, professor of physiology of the University of Chicago, will deliver the Noble Wiley Jones lectures at Portland, Oregon, March 23d to 26th. His subjects will be Gastric Secretion in Health and Disease, Problem of the Endocrines (two lectures), Motor Disturbances of the Alimentary Canal, and Problem of the Liver.

Chandler Medal.—Dr. Edward Calvin Kendall, of the University of Minnesota, and head of the Mayo Foundation for Medical Research, has received the Chandler medal for distinguished achievement in science. His lecture was on Influence of the Thyroid Gland on Oxidation of the Animal Organization, and was delivered February 12 at Havemeyer Hall, Columbia University.

New Public Health Association.—The following are the officers of the newly organized Pennsylvania Public Health Association: Dr. Charles H. Miner, Harrisburg, president; Dr. Wilmer Krusen, Philadelphia, and Dr. Carey J. Vaux, Pittsburgh, vice-presidents; Dr. William C. Miller, Harrisburg, secretary and treasurer. A public conference will be held in June at Mont Alto.

Meeting on Syphilis.—The Rehabilitation Institute and General Hospital Clinical Society will hold a meeting March 9th at nine p. m., at the hospital, 328 West Forty-second Street, to be devoted to syphilis in its clinical manifestations. Dr. Herman Goodman will present moving pictures and lantern slides of spirocheta pallida (in motion), cutaneous lesions, and visceral changes. Physicians are invited to attend.

Ella Sachs Plotz Foundation.—Applications for grants from the Ella Sachs Plotz Foundation for the year 1925-1926 should be received by Dr. Francis W. Peabody, secretary, Boston City Hospital, Boston, before May 15th. However, consideration will be still given to applications up to September 15th, if the funds are not all used. Of thirty-two applications, eight grants were made, four of them on the general subject of chronic nephritis.

American Ward in London Hospital.—An effort is being made to raise an endowment fund of $60,000, for twelve beds in the George Washington Ward of the Royal Free Hospital of London, a maternity ward named in recognition of the help given the hospital by the American Women's Club of London during and since the war. Dr. May Thorne, an English physician, and one of the governors of the hospital, is in this country in the interests of the fund, and delivered a lecture at Bellevue.

Study of Thromboangiitis Obliterans.—A committee has been organized for the study and treatment of Thromboangiitis obliterans, with Dr. Reginald Sayre as chairman and Dr. Benjamin Jablons as secretary. The membership of this committee is as follows: Dr. Fred H. Albee, Robert F. Barber, Harlow Brooks, Leo Buerger, G. A. Friedman, A. L. Garbat, Charles Goodman, I. W. Held, Harry E. Isaacs, Maximilian Lewson, Willy Meyer, Marcus Neustaedter, A. I. Ringer, DeWitt Stetten, Gregory Stragnell, Benjamin T. Tilton, Walter Timme, Walter Truslow and Dr. Henry Keller.

Cancer Clinics.—The health department of Columbus, Ohio, has arranged six free cancer clinics, in cooperation with various hospitals of the city.

Doctor Spielberg Honored.—Dr. William Spielberg, of New York, who has recently returned from Palestine, was guest of honor at a dinner at the Hotel McAlpin.

Dr. Crile Lectures.—Dr. George W. Crile, of Cleveland, lectured on Certain Points in Abdominal Surgery, illustrated with lantern slides, before the Flatbush Medical Society of New York.

Doctor Garrison in New York.—Dr. Fielding H. Garrison, of the Army Medical Museum, held an informal conference in diabetes and insulin at the Academy of Medicine, New York, Saturday, February 21st.

Doctor Kopetsky Honored.—Dr. Samuel J. Kopetsky, president of the Medical Society of the County of New York, will be guest of honor at a dinner March 12th, at the Commodore Hotel. Tickets may be obtained from Dr. Philip Horowitz, 57 West Seventy-third Street.

Open Air Classes.—Twenty cities and one village of New York state, coming under the medical inspection law, maintain open air schools or classes, taking care of nearly one thousand children. The results in improvement of physical and mental health of the children are reported to be very satisfactory.

Doctor Mosher Honored.—Dr. Eliza Mosher, of Brooklyn, will be guest of honor of a dinner at the Hotel Roosevelt, on March 25th, to mark her fiftieth year in the practice of medicine. Physicians and others desiring to attend the dinner may apply to Jean G. Cross, 140 West Fifty-fifth Street, New York.

Babies' Hospital to Join Medical Centre.—Official announcement has been made of the decision of the directors of the Babies' Hospital of New York, to join the new medical centre of Columbia and Presbyterian Hospital. The Hospital has been associated with Columbia for twenty-four years as a teaching centre, and its removal to the new location will give it the better surgical and dispensary facilities it needs.

Endowed Hospital Room for Physicians.—The Physicians Endowed Room Association is endeavoring to raise a fund for the endowment of a room at the Lutheran Hospital, New York, for the use of physicians unable to pay for hospital care. This expense for room and board must be met by a physician himself, even in the institution where he gives his services, and it is the hope of the association to provide at least one room in each hospital for impecunious physicians needing hospital and nursing care.

Lectures on Health Conservation.—At the East Harlem Health Centre, 345 East 116th Street, New York, there will be held Wednesday afternoons at four o'clock, from February 18th to May 20th, a series of lectures on community aspects of health conservation and disease prevention. Dr. Iago Galdston, of the New York Tuberculosis Association, will supervise the lectures, which will be under the auspices of that organization and the Public Health Committee of the Academy of Medicine.

Personal.—Dr. Modie E. Cunningham has been appointed resident physician of the Burke Foundation, White Plains, New York.

Dr. M. Joseph Mandelbaum, of New York, gave by invitation a Demonstration of Lamb's Lung Manikin for Bronchoscopic Study and Practice," before the section on otology and laryngology of the College of Physicians of Philadelphia.

Dr. George W. Duvall, of Owensboro, Kentucky, director of the Daviess County Health Department, has been appointed superintendent of the Central Free Dispensary of Rush Medical College, Chicago.

Dr. George W. Meister has accepted an appointment as superintendent of the Samaritan Hospital, Philadelphia, resigning from his position as superintendent of St. Luke's Homeopathic Hospital.

Dr. Russell L. Cecil, of New York, spoke before the Chicago Medical Society February 11, on Recent Advances in Specific Therapy of Lobar Pneumonia."

Dr. Joseph F. Saphir has received an appointment as attending proctologist to the Jewish Maternity Hospital.

Dr. Hannah M. Stone has been appointed assistant medical director of the clinical research department of the American Birth Control League, 104 Fifth Avenue, New York. Dr. Stone takes the place of Dr Dorothy Bocker.

Foreign Correspondence.

LONDON LETTER

(From our own correspondent)

London, *January 27, 1925.*

TRAINING OF MIDWIVES

With a view to reducing mortality and disability among mothers and infants, the Central Midwives' Board of England and Wales have decided that the period of training for midwives should be extended to twelve months, except in the case of certain trained nurses, for whom the period of instruction will be six months. The new rules which it is hoped will come into operation on May 1st next will require much greater attention to be given to matters antenatal and will provide for the training of pupils of experience both in intern and extern work. These requirements alone, the board states, should go far to affect favorably the health and welfare of both mother and baby. During 1923-24 forty midwives were dealt with by the board under its penal powers to answer charges of malpractice, negligence or misconduct. These forty cases resulted in the immediate removal from the roll of the names of twenty-two women, three of whom were prohibited from attending women in childbirth. Two others were censured and three cautioned, while in three cases no action was taken. In nine instances sentence was postponed. Of the forty cases tried, thirteen were those of women who had neglected to advise medical assistance in cases of ophthalmia neonatorum.

TOXIC CONDITIONS FOLLOWING ETHER ANESTHESIA

At a meeting of the Liverpool Medical Institution held on January 8th last, Dr. R. T. Minnit read a paper on some toxic conditions following ether anesthesia and their successful treatment. He described the symptoms after ether anesthesia in the nondiabetic case as less than but comparable with those occurring in the diabetic. He showed that there was a definite relationship between the hyperglycemia associated with ether anesthesia and the toxic symptoms which follow. He suggested that treatment for these should be on the lines found so successful in the case of the diabetic, and drew the following conclusions from eight selected cases out of about thirty: 1. That there is a definite rise in blood sugar varying with the length of anesthesia. 2. That in the case where the blood sugar falls at the conclusion of the anesthesia to more or less normal, and does not rise again, that the patient suffers little, if at all, from toxic symptoms, such as vomiting, pallor or acidosis. 3. From the sugar tolerance test upon a patient before and after anesthesia, the blood sugar curve is so altered as to show the efficiency of the pancreas is impaired. 4. Patients who exhibit toxic symptoms after anesthesia have a secondary rise in blood sugar synchronously therewith. 5. Upon the administration of insulin to patients with these toxic symptoms, when the blood sugar is brought down they recover. 6. The administration of insulin may have to be prolonged until the blood sugar is reduced, for it is not until then that improvement takes place. 7. The administration of insulin at the end of ether anesthesia can prevent or mitigate the toxic symptoms.

Dr. Pemberton discussed the action of ether in producing hyperglycemia of a maintained type. He pointed out that as Dr. Minnit had shown the carbohydrate tolerance was considerably diminished so that the effect of ether was probably not only glycongenolytic, but also on the islet tissue of the pancreas.

Dr. R. E. Roberts read a paper on the value of x rays in the examination of the stomach and duodenum. His paper was based on a survey of 319 consecutive cases in which the stomach and duodenum were examined subsequently by the surgeon on the operating table. The direct and indirect evidence on which the radiological diagnoses were made was briefly indicated, of forty-seven cases giving radiologically normal findings, only two showed any lesion at operation, in both cases situated at the cardiac end of the stomach. In fifty-four cases where the surgeon found no lesion at operation nine had shown abnormal x ray findings. Suggestions as to the possible explanation of these discrepancies were put forward. Diagnostic x ray evidence of the lesions found at operation had been obtained in 232 of the 250 cases in which a gastric or duodenal lesion was found at the operation; 14—5.6 per cent. showed evidence which was not diagnostic while only 4—1.6 per cent. showed no x ray evidence at all of abnormality of appearance on function of stomach or duodenum.

Dr. G. J. Spriggs congratulated Dr. Roberts on the practical value of the paper. Some years ago he had published a series in which the clinical diagnosis was compared, first, with the diagnosis made after scientific examination, chemical, bacteriological and radiological, and secondly, the ultimate diagnosis arrived at by operation on the subsequent development of the case. The scientific examination altered, added to or modified the clinical diagnosis in more than half the cases. There were just over one per cent. in which the diagnosis after scientific examination, including the use of x rays, proved to be in error, but in all of these the advice given, namely, an exploratory examination, had proved to be wise. He and his radiological colleague, Mr. Marxer, who was present, agreed that irregularities on the greater border, particularly near the cardiac end, sometimes gave rise to difficulty, which, however, generally disappeared on reexamination. The alteration of function was especially important near the pylorus, particularly, as Dr. Roberts mentioned, arrest of the peristaltic wave if carefully observed. He thought that in the pyloric and duodenal regions there would be a larger proportion of cases in which direct evidence of lesion was obtained if patients were repeatedly examined in the prone position at different angles of rotation.

HABITS AND HEREDITY

It is difficult for the laity and not infrequently for medical men always to follow the statements on heredity by authorities as different views are being promulgated at different times. At one time Lamarck and his followers were looked upon as deluded persons, because they believed that acquired characters could be and, in fact, were passed on from parent to child. Orthodox science then laid it down as an axiom that a parent could bequeath nothing corporeal and mental which was not innate in his own frame. The pendulum has swung backward and Professor

McBride now states that habits can be inherited and on this account as generation succeeds generation, education should become easier to the young. It is instructive although somewhat confusing to note how views as to heredity change. We seem at the present time to be returning to the beliefs of our forefathers that a predisposition to many if not most diseases can be transmitted by heredity. Diathesis used to be almost sneered at by the ultrascientific members of the profession. It now appears to be becoming the vogue. There are probably fashions in medical science as well as in treatment and medicines.

RESIGNATION OF SIR HAROLD STILES

It is stated that Sir Harold Stiles has resigned the chair of clinical surgery in Edinburgh University to which he was appointed in 1919. For his cancer research he gained the first award of the Walker Prize of the Royal College of Surgeons of England. The American Surgical Association gave him an honorary fellowship and he received the honor of Knighthood from the King for services rendered during the war.

NEW BOOKS

The *Medical Year Book* for 1925 compiled and arranged by Mr. Charles R. Hewitt, late librarian of the Royal Society of Medicine, was issued recently. This is the second issue. On the occasion of the publication of the first medical annual edited by Hewitt, the work was mentioned favorably in a former letter. Little can be added to the eulogies pronounced then except that the present issue is fuller and has been brought up to date including some important information which was lacking in the first edition. It is wide in its scope, as far as the medical profession here and its activities are concerned, and yet handy in size and may be particularly recommended to the notice of American medical men who visit this country and desire to be well informed as to all that concerns medicine. It is published by William Heinemann, Ltd.

Another book first brought out by the same firm is *Acute Infectious Diseases,* by J. D. Rolleston, M.A., M.D. (Oxon.). This book deals with the commoner acute infectious diseases from the viewpoint of twenty-five years of personal experience reinforced by a study of their literature. It should be said that only those diseases are discussed which are mainly or exclusively notifiable and treated in isolation hospitals. The work is chiefly of a clinical nature but succinct accounts are given of the diseases from the bacteriological and pathological angle, as well as a brief history of each disease. The book is not illustrated because it is the author's conviction that the only satisfactory place to study the cutaneous lesions of the acute exanthemata, the various morbid appearances of the throat and the temperature charts, is at the bedside. In his opinion, and there are a large body of medical men who will echo his views, some excellent textbooks have been disfigured rather than improved by the reproduction of photographs or drawings which show little or convey an entirely misleading impression. The book may be recommended to the medical profession as being what it purports to be, a good clearly written clinical description of the diseases discussed by a man of experience with a description of the other aspects.

Yesterdays, by Lucy Seaman Bainbridge, mother of Dr. William Seaman Bainbridge, which has just come into my hands, is a charming autobiography of a talented woman imbued with that love of travel and intelligent inquisitiveness which seems to be a characteristic of the educated American woman. Mrs. Bainbridge's book is a family book, as all autobiographies are, and tells us among other things that her mother became a medical woman in the days when the practice of medicine was regarded as not befitting a woman. Perhaps the most intriguing part of the book is that in which she narrates her experiences as Nurse Ohio in the Civil War. However, throughout its pages the interest never flags and Mrs. Bainbridge is to be congratulated on relating intimate affairs and great affairs alike in a manner to hold the attention of the reader.

The second edition in French of the *Problem of Cancer,* by Dr. William Seaman Bainbridge, of New York, and translated by Dr. E. Hertoghe, of Antwerp, has been issued recently from the Royal Press of Louvain University. It may be recalled that the first French edition was published at the request of the King and Queen of the Belgians, the King accepting the dedication of the book, and it was the first book to be published at the press of the University of Louvain after its destruction by the Germans. The present issue of this comprehensive work on cancer has been considerably enlarged and thoroughly revised and brought up to date.

LATIN AMERICA LETTER

(From our own correspondent)

Balboa Height, C. Z., *January 10, 1925.*

RESEARCH AT BARRO COLORADO ISLAND

The Panama Canal maintains a research station on Barro Colorado Island in Gatun Lake, where scientists may come for the purpose of carrying on scientific investigations especially in medical entomology and zoology. The United Fruit Steamship Company has renewed its offer, furnishing a number of passes between New York and the Canal Zone to properly accredited scientists, who wish to come to Barro Colorado for study. The passes furnish transportation only, and the traveler must pay for meals. During the past year quite a number of research workers arrived at Barro Colorado and were well satisfied with the experimental station. The station is in charge of Dr. James Zetek, entomologist of the Department of Agriculture.

IMPROVEMENTS IN CHILEAN PORTS

The Chilean Government recently asked for bids for construction of improvements at the ports of Lebu, Constitucion, and Antofagasto. These contemplated improvements will have a great bearing upon the sanitary condition of the ports. Among the improvements considered will be the erection of rat proof wharfs and warehouses. Valparaiso and San Antonio have already been equipped with rat proof docks. The amount of expenditure involved is estimated to be around $5,000,000 gold. Rat plague is very prevalent along the west coast of South America and these improvements will go a long way to help in eradicating this disease. The

recent reorganization of the Government of Chile exemplifies with great clarity the progress that is being made in that country. The most noted improvement is the entire reorganization of the health department and the appointment of Dr. Alejandro del Rio as Minister of Health and first chief of the new ministry. He is well qualified scientifically for the position and has been active in the organization of the existing good hospitals throughout Chile. He is one of the editors of the government quarterly, *Revista de Beneficencia Publica.*

VITAL STATISTICS OF THE CANAL ZONE

A total of 144 deaths occurred during the month of November, 1924, among the population of the Canal Zone and in the cities of Panama and Colon. This is equivalent to an annual death rate of 13.49 in a thousand. The leading causes of death were: tuberculosis (various organs), thirty-three; pneumonia (bronchial and lobar), thirty-three; diarrhea and enteritis (including colitis), seven; there were four deaths from cancer and two deaths from dysentery. Of the total deaths, thirty per cent. occurred among children under five years of age. There were sixteen deaths among nonresidents of the Isthmus, but these are not included in those statistics. There were 333 live births reported during the month and twenty-one still births. Including the still births, this is equivalent to an annual birth rate of 33.15 in a thousand of population. Deaths among children under one year of age numbered thirty-one, giving an infant mortality rate of 93.09 in a thousand live births.

The total number of malaria cases reported during the month was ninety-four. Of these two were reported from Panama City, one from Colon, fifty from the Canal Zone sanitated area and forty-one originated outside the sanitated area. Of the total, nine were employees, thirty-one were non-employees and fifty-four were Army and Navy personnel. There was one death from malaria.

ISTHMIAN CANAL ZONE MEDICAL ASSOCIATION MEETING

The 216th meeting of the Isthmian Canal Zone Medical Association was held at the Amcon General Hospital at 8.00 p. m., Tuesday, December 16, 1924. An interesting program was presented.

JAPANESE COMMISSION ARRIVES AT CANAL ZONE

A Japanese diplomatic commission composed of physicians and other scientists recently arrived at the Canal Zone for a week's visit. The commission has among its members, Dr. Itchioyama, Dr. J. Hatori, Dr. Moruki, Dr. Koshiga and Dr. Ruoka. These distinguished scientists are making a study of health and economic conditions in the countries of Central and South America. Dr. J. Hatori is at present Chief Health Officer of the Island of Formosa, one of the Japanese possessions, and is well known to many American physicians on account of his extensive writings in American Scientific Journals, particularly on the subjects of malaria and rat bite fever. He is one of the leading biologists of Japan.

The commission has finished a study of conditions in Central America and have now started on their tour of South America. It will take about a year to make the study before they return to their own country. Dr. Hatori will later go to the United States for the purpose of visiting the surgeon general of the United States Public Health Service, and officers connected with the research department of the Hygienic Laboratory. Coincident with the arrival of the commission, three Japanese warships also visited the Canal. Seven medical officers of the fleet, together with the commission, were entertained by officials of the Health Department and shown over the Zone, especially the hospitals, sanitary and quarantine activities and a visit to the Palo Seco Leprosy Station.

UNITED STATES BOMBING PLANE DESTROYED IN COSTA RICA

Four army aviators on a visit to Costa Rica fell a distance of one hundred feet when their Martin bomber crashed to earth just outside of San Jose, Costa Rica. The big machine burst into flames when it struck the earth and was entirely consumed including all the equipment of the army men. How they escaped instant death is one of the miracles of aviation and a mystery to the medical men who were rushed to the scene of the accident. After the plane had flown about a mile and was one hundred feet in the air, it apparently struck an air pocket, for although the propeller and engine were going as usual, the bomber seemed to settle to the ground out of control of the pilot. It hit with a crash throwing the four men out. The gas tank burst and in an instant the plane was in flames. The only injuries sustained by the aviators, were a few bruises about their heads and limbs. They returned by steamer to the Canal Zone, none the worse for their experience.

Letters to the Editor.

VAQUEZ'S DISEASES OF THE HEART

BRONXVILLE, N. Y., *February 16, 1925.*

To the Editor:

I appreciate the cordial praise of Vaquez's *Diseases of the Heart* in your issue of January 21st. In so kind a review, it may be ungracious to cavil at a minor point but I cannot permit my author to rest under the imputation of the error that you ascribe to him. Your reviewer says: "Dr. Laidlaw's translation is faithful and fluent. Indeed, he even translates a mistake from the original French to the effect that Stephen Hales's pioneer blood pressure studies were made on a dog, when in fact that reverend gentleman conducted his experiments on a mare."

If it were so, it was a grievous fault and grievously shall Cæsar answer it; but it is not so. Everybody has heard of Stephen Hales's mare; apparently not everybody has heard of Stephen Hales's dogs, twenty of them, used in the same experiments. This is not surprising, for Hales's book was published in London in 1733 and a French translation in Geneva in 1744; copies are rare; the dogs are mute; and modern physiologists speak only of the mare. In this book, *Hemostaticks,* on page 42, Hales tabulates the results of his experiments on two mares, one gelding, one ox heart, one sheep, one doe and the twenty dogs aforesaid.

GEORGE F. LAIDLAW.

Book Reviews

PLASTIC SURGERY OF THE FACE

Facial Surgery. By H. P. Pickerill, C.B.E., M.D., M.S. Introduction by Sir W. Arbuthnot Lane. New York: William Wood and Co. Edinburgh: E. & S. Livingstone, 1924. Pp. 160.

Dr. Pickerill was in charge of the New Zealand section at Queen Mary's Hospital, Sidcup, England, and consequently had a wide and varied experience in procedures for the relief of war injuries to the face. The present work contains many photographs representing cases treated at Sidcup, forming a useful addition to the record furnished by Gillies and others of the Sidcup staff. The work is not by any means, however, a glorification of war surgery. In fact the author concedes that in some instances war practice was "many years behind the recognized surgical teaching." What he does urge, and what he sets out to exemplify, is the outstanding lesson of the war hospital experience, namely, that "there are few, if any, cases, however extensive, to be regarded as beyond restoration by purely surgical measures and from the patient's own tissues"; and that "fresh possibilities and new fields are opened up" by the successes already attained. It is in this sense that Dr. Pickerill has classified the various problems presenting themselves for the care of the plastic surgeon, with very thorough discussion of all methods of repair.

A valuable contribution is that in which the author deals with the covering of defects resulting from the excision of malignant growths, to demonstrate that such growths "may be much more widely excised than was formerly thought possible," and that, since the tissues removed can be suitably replaced, this need not result in permanent disfigurement, or loss of function. All this is quite in line with what is now well recognized in American practice.

At times, in reading this work, one feels that the advance in plastic surgery has been so rapid that in certain fields there are already notable advances upon the methods the author describes. As against that, there are cases here given which point clearly to the successful extension of plastic surgery into areas in which, until very recently, its use was not contemplated.

The section on principles and methods is well arranged and contains much that may be helpful in practice.

BISMUTH TREATMENT OF SYPHILIS

Le Bismuth Dans le Traitement de la Syphilis. Par C. Levaditi. Avec 31 Illustrations and one plate. Paris: Masson et Cie., 1924. Pp. 316.

In this monograph Levaditi discusses most thoroughly the progress that has been made in the employment of bismuth in the treatment of syphilis. In spite of the ever growing literature on this phase of antiluetic therapy, it is surprising that so much in the way of clinical and theoretical data can be accumulated within the covers of a single volume on a subject of such recent development.

The author needs no introduction to medical men. For several years past, since the introduction of bismuth as an antiluetic, he has worked assiduously on the subject of bismuth therapy and he presents his conclusions in this volume. Summarizing these views briefly, he advocates the use of bismuth as an adjuvant to the arsenicals and as a substitute for them in those cases in which the latter cannot be employed; neoarsenobenzol and bismuth, in alternation, constitute the ideal treatment for lues; bismuth is best given intramuscularly, inasmuch as the intravenous method of administration has not yet been made feasible; properly administered, the injection is absolutely painless; the Wassermann reaction is quickly controlled by bismuth; there are no deleterious after effects or reactions after its use; nitritoid crises never occur after bismuth injections; thirty-six bismuth preparations are mentioned as being used in France, but the author seems to favor trepol and neotrepol, as the most efficient and least irritating.

The book is well written and fully covers the ground. It is a work with which everyone engaged in the treatment of syphilis should be intimately acquainted.

MALIGNANT NEOPLASMS

Die Klinik der bösartigen Geschwülste. Herausgegeben von Dr. P. Zweifel, und Dr. E. Payr. In drei Bänden. Mit Textabbildungen und farbigen Tafeln. Band I: Allgemeine Geschwulstlehre, Haut, Nervensystem, Kopf und Hals. Mit 204 Textabbildungen und 33 farbigen Tafeln. Leipzig: Verlag von S. Hirzel, 1924. Pp. xx-860.

This is the first of three volumes comprising a stupendous work on malignant tumors, intended for use by the general practitioner, the hospital physician and the specialist. This work presents the present state of our knowledge regarding the pathogenesis, early diagnosis, tissue peculiarities, methods of spreading, symptomatology, clinical course, diagnosis and methods of treatment of malignant neoplasms in the various organs of the body; also the postoperative treatment of the late complications by the general practitioner. All these subjects are discussed with the underlying thought of the curability of cancer, the cause of which is being sought so universally. It appears as though this goal was gradually being reached. The statistical increase in the number of cancer cases may be partially explained by better and more frequently correct diagnoses. The absence of pain in precancerous conditions should be a warning signal. The fact that cancer is at first only a local disease is emphasized and early diagnosis and treatment are therefore imperative. In this work cancer is considered as a general disease and the peculiarities of tumor development in the different organs as to course, dissemination and final result are discussed, and from these a pathological physiology of malignant tumors is built up.

Each author gives his own personal experiences, with the result that this work is a mosaic of impressions of the various clinicians, all specialists, unified by the bond of pathological anatomy and biology. Although surgery has so far given the best results, surgery and irradiation therapy should supplement each other, and serum and vaccine therapy should not be neglected. The illustrations are beautiful and numerous and the colored plates deserve special mention. Only such references (especially those not

German) are given in the bibliography as are accessible to German readers, but a number of American authors are cited.

Borst discusses the general pathology of malignant tumors and he considers malignancy as the resultant of cell degeneration, the surroundings of both these cells and the constitution and predisposition. The causes may be general, local and cellular. After discussing the general morphology and general biology of malignancies, he takes up the histogenesis, classification and the nomenclature of malignancies; also the sarcomas and carcinomas and the special forms and mixed forms of malignancies. Carcinoma and sarcoma of the skin are described by Delbanco and Unna. Xeroderma pigmentosum is assigned to Rille. Küttner writes about the malignancies of the scalp and skull. Malignancy of the nervous system is the work of Pette. Payr takes up the subject of the operative and irradiation treatment of cerebral malignancies. Those of the eye are described by Sattler; those of the ear, nose and accessory nasal cavities, pharynx and larynx by Knick. Malignancies of the maxilla, tongue and oral cavity are discussed by Partsch and those of the salivary glands by Heineke. Kocher writes about the malignancies of the thyroid, parathyroid and carotid glands and about malignant branchiogenic tumors.

This is undoubtedly the most complete and authoritative work on the subject of malignant tumors.

BASAL METABOLISM

Basal Metabolism in Health and Disease. By Eugene F. Dubois, M.D. Illustrated with seventy-nine engravings. Philadelphia and New York: Lea and Febiger, 1924. Pp. 372.

The author is one of the foremost American workers in the field of metabolism. He sets forth in this book an authoritative and comprehensive review of our present knowledge of this subject. The first part of the work deals with metabolism in health, the second with metabolism in disease. The exposition of fundamental principles will appeal to the beginner for whom the book is primarily intended. There are, however, numerous historical surveys of special topics which will undoubtedly interest the more advanced student as well. The presentation is that of a competent scientist who tells not only how much in this new field is known, but also how much is still the subject of speculation, debate and active investigation.

GOLD TREATMENT OF TUBERCULOSIS AND LEPRA

Die Goldbehandlung der Tuberkulose und der Lepra. Klinische Erfahrungen mit Krysolgan. Von Adolf Feldt. Dritte vermehrte Auflage. Halle a.S.: Carl Marhold, 1924. Pp. 50.

Krysolgan is an aminoaurothiophenol carbonate of sodium, containing fifty per cent. gold, which is injected intravenously. It is a specific remedy as it produces focal reactions after the administrations of therapeutic doses. It is contraindicated in cases of tuberculosis with high fever and in cases that have advanced too far. The doses are gradually increased from 0.05 gram to 0.5 gram. It is indicated in tuberculosis of the lungs, eye, larynx, nose and throat, skin, in psoriasis, surgical tuberculosis, tuberculosis of the gastrointestinal tract, urinary organs and in lepra. It may also be used in conjunction with mercury and it is indicated as a preliminary treatment to tuberculin therapy. It is applicable in ambulant cases.

In this edition the author collected the numerous reports on the clinical and experimental studies on the treatment of tuberculosis and of lepra with krysolgan which he found scattered throughout the literature. A complete bibliography is appended.

BICKHAM'S SURGERY

Operative Surgery. By Warren Stone Bickham, M.D., F.A.C.S. In Six Volumes and a General Index. Volume IV: Pericardium, Heart, Other Endothoracic Operations, Abdominopelvic Wall. Herniae-Peritoneum; Omentum-Mesentery-Stomach, Pancreas, Spleen, Liver, Biliary, General Intestinal, Appendicocecal Tract. With 772 Illustrations. Pp. 842. Volume V: Colorectoanal Tract, Kidney, Suprarenal Glands, Ureter, Bladder, Male Urethra, Penis, Scrotum, Testicle, Spermatic Cord. With 1118 Illustrations. Pp. 880. Volume VI: Seminal Vesicles and Ducts, Prostate, Female Urethra, Perineum and Genitalia, Pregnant and Puerperal Uterus, Ectopic Pregnancy, Operations on the Newly Born, Deformities. With 1224 Illustrations. Pp. 989. Philadelphia and London, W. B. Saunders Company. 1924.

On reviewing the last three volumes of this system of surgery, one is impressed by its general excellence. It is infinitely superior in completeness of detail, in illustrations and in the general subject matter to any recent system of surgery. It is very complete and is accompanied by a separate volume which is the general index. This makes a very satisfactory arrangement. It seems almost impossible that one man could have covered this entire field; arranged and provided for the illustrations, and reviewed the anatomical details which are given at the beginning of each article.

One must give credit to Saunders for the tremendous expense which must have been involved in reproducing the many excellent illustrations. One might always complain of omissions and certain ones occur in these volumes. For instance, there is no reference to the operation of sympathectomy as described by La Riche. The reviewer considers this system of surgery an important part of every surgeon's armamentarium.

CLINICAL INTERPRETATION OF EYE SYMPTOMS

Sémiologie oculaire. Le Diaphragme iridociliaire. Par Félix Terrien. Paris: Masson et Cie, 1924. Pp. 1-234.

This study constitutes the second volume of the author's *Sémiologie oculaire,* and covers the anatomy, physiology, and pathology of the iris and ciliary body. The subject is treated from the point of view of the clinician, the author's chief aim being the clinical interpretation of the symptoms as they present themselves in the many pathological conditions of the two organs. Considerable space is devoted to the functional disturbances of the iridociliary curtain, in which the subject of the pupil and its variations in disease is gone into most exhaustively. Iritis and iridocyclitis, contusions of the iris and ciliary body, tumors and malformations, and variations in ocular tension, form the other chapters of this work. The value of the text is considerably enhanced by numerous illustrations, some of which, as for instance, tuberculosis of the iris on page 133, persistent pupillary membrane on page 180, and a few others, are particularly interesting.

INTERNATIONAL CLINICS

International Clinics. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Articles by Leading Members of the Medical Profession Throughout the World. Edited by Henry W. Cattell, A.M., M.D., Philadelphia. Volumes III and IV. Philadelphia and London: J. B. Lippincott Company, 1924.

The usual high standard maintained in the selection of the articles and papers for these clinics, has been maintained in the volumes under review. In Volume III the outstanding article is one by B. Sherwood Dunn, of Paris, on The Evolution in the Treatment of Syphilis: Past and Present. This article would make a fine monograph on the modern treatment of lues, if published separately. Another highly interesting contribution is one by Harry Eaton Stewart, on The Use of Diathermy in Pneumonia, in which this procedure is warmly advocated as a most useful adjuvant in the treatment. It is declared to be absolutely safe in competent hands, brings almost certain symptomatic relief and has apparently lowered the mortality in a group of cases which included all types.

Volume IV contains twenty-two interesting papers on varied subjects, including a concise and thorough résumé of the treatment of diabetes by insulin, by its discoverer, F. G. Banting, of Toronto. His views are summed up in the last brief paragraph of his article: "Insulin is not a cure for diabetes; it is a treatment. It enables the diabetic to burn sufficient carbohydrates, so that proteins and fats may be added to the diet in sufficient quantities to provide energy for the economic burdens of life."

Ernest Schulmann, of Lyons, France, has an unusually interesting article on Syphilis of the Thyroid Gland, with Special References to Exophthalmic Goitre. This is well worth reading. Other contributions of note are made by P. J. Flagg, on Ethylene, by Alfred Hand, on The Effect of Tonsillectomy on Existing Visceral Disease, and by Sterling Bunnell, of San Francisco, on The Nature of Intestinal Obstruction. Both volumes are freely illustrated.

MORE SEMBAL

The House of Prophecy. By Gilbert Cannan. New York: Thomas Seltzer, 1924.

The second novel in the Sembal series, to those who know the first, probably carries on the penetrating study of this meteoric young Hebrew in a fashion even more cumulative. A story rather intense, even sympathetic, has been superimposed upon a sociological framework. Racial trends have become traits, inhuman forces, environment, family, postwar chaos have been not humanized, but puppetized. There is a symbolic virtue in Cannan's parable which tends to obscure its qualities as a tale of human interest. The economic war in England between Jew and Gentile is brought home to the reader with perhaps more telling force than textbooks on the undercurrents of sociological research could possibly do. We suspect just what the shortcomings of the old order were. We can interpret intelligently the new moves in the great game of psychological interplay between two powerful races. But the emotions of an American are only vaguely brushed if at all. And the story therefore does not thrill us much.

An imprisoned philosopher and a rare young English girl, meshed in the toils of attraction Sembal and all he represents of struggle, intellect emotionalism, apart from sheer weird personality county families shut off in the industrial towns they called into being and that have now outgrown the feudal age in which those barons still long to live finally the triumph—implied—of this member of the Jewish race who always gets what he wants this makes the story.

But if you like your economics painlessly, if you would rather learn from dramatized cold facts than feel them out for yourself in all their hopelessness by all means follow the fate of Sembal and learn therefrom the destiny of England.

CHILD PSYCHOLOGY

Love in Children and Its Aberrations. A Book for Parents and Teachers. By Oskar Pfister. Translated from the German by Eden and Decar Paul. New York: Dodd Mead and Company, 1924. Pp. 576.

In spite of certain minor restrictions this work of Pfister's is of fundamental value. Attention is called to the many classical components of the psychological makeup of the child. Although the book is somewhat bulky, it is clearly written and every paragraph has its valuable and suggestive material. At times Pfister lays undue stress on the transient ethical and moral values but this is a universal fault and no doubt more apparent in his work on account of his natural conditionings. The physician, the educator, the parent, and the student of human behavior will do well to study this last contribution from the pen of one of the most sincere workers in abnormal psychology.

Medicoliterary Notes.

One of the deplorable facts brought to light by the present widespread interest in preserving the fast disappearing wild life of this country, and, in fact, of the whole world, has been the great prevalence of lead poisoning among game birds. This is caused by the birds' finding in the mud about shooting points and blinds in marshes and on shores of lakes and streams a large quantity of expended shot which they eat. The amount of this shot is estimated as enormous owing to the greatly increased number of hunters. The birds that have suffered most are whistling swans, mallard and canvas back and pintail ducks.

* * *

According to interviews recently reported in the daily press, Dr. Arthur Selby, a medical missionary from England who has returned to that country for a vacation after long service in Central Africa, states that it has recently been learned in Nyasaland that a certain species of dragonfly preys on the deadly tsetsefly which causes the socalled sleeping sickness. Central African physicians are now engaged in cultivating this parasite on a large scale, hoping they may thus be enabled to stamp out the pestilence.

* * *

That the United States record of ten thousand murders a year is too low, and that the only adequate method of meeting the problem is for the Government to tabulate data periodically from court records, were statements made recently in an address by Dr. Frederick L. Hoffman. He believes that many cases of so recorded accidents are really homicides.

* * *

The report to the House of Delegates of the Commission on Cancer of the Medical Society of the State of Pennsylvania has been issued as a reprint from the *Atlantic Medical Journal for* September, 1924. In 1910-11 the commission made a survey of the cancer situation in Pennsylvania with a view especially of showing the extent of

delay that cancer cases went through before seeking adequate treatment. It was decided to make in 1923 a similar survey to learn whether cancer education pays and how previous efforts could be improved upon. The tabulated report shows, in the large decrease in delay of treatment of every form of cancer, that education does pay; and the commission recommends as the best method of improving upon former efforts the setting aside of a special fund to enable the poor to have adequate examination and diagnosis without the present usual exorbitant charges.

* * *

Stuart P. Sherman, editor of *Books*, the Herald Tribune's literary supplement, has an excellent article on Pierre Loti in the issue of January 18th.

* * *

Red Cross workers in Manhattan have sent to the Library of Congress 12,300 pages of Braille reading material for distribut on at once among blinded soldiers. The gift comprises short stories, magazine and newspaper articles, novels, history, textbooks, and scientific works. It took nearly five thousand hours, the equivalent of more than two years' work, for the Braille operator to prepare them. The work was taken over by the Red Cross because no commercial process has been devised for making books for the blind which would be within reach of the pocketbook of the average blind person.—*New York Times.*

* * *

In Paris it is required by law that a doctor be present at every theatrical performance. Most French managers refuse to employ regular house physicians, so seats are presented instead to doctors so that the law may be complied with. Some of the managers are now complaining that often the doctors do not come, but hand their tickets to friends who are not of the profession. The managers now propose, according to the *Living Age*, to make arrangements with physicians whose offices adioin their theatres so that they will be immediately available if called upon. "The doctors, who are perfectly satisfied with things as they are, protest vigorously that, attending the theatre as they have been doing, they have treated two hundred cases during the last theatrical season—which seems to show that they earn their seats."

* * *

The famous burglar, Williams, who once broke into the house of Mark Twain, has written a book about his life, *In the Clutch of Circumstances*, recently published by Appleton. He is no longer a burglar, but "reformed" many years ago, and has since become a very successful business man—which seems logical!—devoting most of his savings to helping criminals who had a wrong start in life to begin over again. Williams was recently guest of honor at a banquet given him by the leading business and professional men of Hartford, Conn.

* * *

Since many inquiries received by the National Committee for Mental Hygiene are of general interest, a column of such questions has been opened in the monthly *Mental Hygiene Bulletin*, in which such as may be answered briefly will be published each month. An appended section will give suggestions as to what to read.

* * *

A fertile field for psychoanalysis should be the forthcoming novel, *Cheating the Devil*, by Juanita Burbridge, to be published by Nicholas Brown. It has been announced that this novel is based upon a series of dream experiences which the author had while she was very ill in 1918. One of the incidents of the book is said to be the exact prediction, to the day and hour, of the ending of the World War.

* * *

How many of us know that Peter Mark Roget, of *Thesaurus* fame, was for several years physician at the Manchester Infirmary in Manchester, England, where he was one of the founders of the Manchester Medical School? Roget was born in 1779, and lived to be ninety, preserving health and vigor throughout his long life.

* * *

Dr. C. G. Kerley has an article in the February *McCall's Magazine on* The Child Who Has Rickets.

* * *

The *American Mercury* for February is a number of special interest. It contains a short story by James Branch Cabell called Above Paradise; an article, Up from Methodism, by Herbert Asbury; The Drug Addict, by Robert A. Schless; Walt Whitman Neologisms, by Louise Pound; George Moore at Work, by Barrett H. Clark; Golden Wedding, a story by Ruth Suckow, and other characteristic contributions.

* * *

According to the Parisian press, a trial has been asked is *The Borderland; Some Problems of Insanity*, by Dr. Theodore Bulkeley Hyslop.

* * *

The man who complains because he has to pay ten cents for his Sunday paper may find some consolation in the thought that the Russian muzhik who craves the luxury of a daily journal has to make a rather heavier sacrifice to obtain it. The subscription price of *Pravda*, the official Communist daily of Moscow, is thirty poods, or more than a thousand pounds of rye per annum. This is nearly the normal crop on a dessiatine of land. Since the average farm is four or five dessiatines in extent, a peasant subscriber—assuming him to exist—would have to pay approximately one fifth of his farm income for his daily paper.—*Living Age.*

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According to the Parisian press, a trial has been asked for in the Appellate Court to clear the name of Bluebeard, who was burned to death in 1440 for sorcery and the murder of 800 women and children. Several historians and members of the Academy, it is claimed, have found proof that the Baron de Retz, Bluebeard's original, was a Marshal of France and companion in arms of Joan of Arc, and was in reality a most gentle knight. Part of the proof was the finding of a vein of gold in a rock under the castle of Machecoul, one of the Baron's strongholds. One of the crimes which had most weight in his trial for heresy was "the manufacture of gold" supposedly made out of the blood of the 800 victims. This find is considered to be sufficient evidence for a new trial.

* * *

The press reports that the feelings of the Bulgarians are greatly wounded by the recent production in Berlin and Vienna of Bernard Shaw's *Arms and the Man*, where it was seen by sensitive Bulgarian students. The play had already been cut by the producer at the request of the Bulgarian Minister, who complained that it ridiculed the Bulgarians. Mr. Shaw in a letter to the editor of the *Berliner Tageblatt* is quoted as having stated that he greatly regretted that the play had wounded the susceptibilities of the Bulgarian students, but he asked them to remember that it was the business of the writer of comedy to wound the susceptibilities of his audience. The classical definition of his function was "the chastening of morals by ridicule." "When the Bulgarian students, with my sincerely friendly assistance," he concludes, "have developed a sense of humor, there will be no more trouble."

* * *

The manuscript of a book of forty thousand words has been taken down in shorthand and transcribed by a typist blind from birth. She is employed by the National Institute for the Blind in London, and used in accomplishing this unprecedented feat a shorthand machine which makes an impression in Braille characters on a ribbon of paper. These notes were read with the left hand in as short a time as that taken by a seeing typist in consulting her shorthand notes.

* * *

A study has recently been made by Dr. Thomas H. Haines, director of the Division on Mental Deficiency of the National Committee for Mental Hygiene, of the special training facilities for mentally handicapped children in the public schools of the United States. This study outlines the progress in making such special provision, and gives such data as the number of these classes, their teachers, and pupils enrolled. In the 430 cities and other school districts included in the study, there were found to be nearly 46,000 children and 2,492 teachers in such special classes. From the data given it is estimated that there are over 900 000 mentally defective and borderline defective children in the public schools of this country, in addition to the 70,000 children now in special classes or state training schools for mental defectives.—*Mental Hygiene Bulletin.*

Abstracts from Current Literature

DERMATOLOGY

Acute Disseminated Lupus Erythematosus.—Chester S. Keefer and Augustus R. Felty (*Bulletin of the Johns Hopkins Hospital,* September, 1924) report three fatal cases presenting the typical clinical picture and course of acute disseminated erythematous lupus, in two of which autopsies were performed, and detailed descriptions of the findings given. The clinical features were similar in all the cases, the syndrome presenting rather a distinct entity as far as clinical observation was concerned. The only constant pathological feature common to both of the autopsied cases was small groups of tuberculous lymph glands; but no extensive tuberculous lesions were found. In one case, tubercle bacilli of the human type were recovered from a lymph gland which did not show the histological lesion characteristic of tuberculosis.

Effect of X Rays on the Skin of Vitally Stained White Mice.—Gerty T. Cori (*Journal of Experimental Medicine,* May, 1924) reports that epilation occurred earlier in vitally stained white mice than in control mice, rayed for the same length of time. The amount of x ray causing total spontaneous epilation of the skin of the mouse is suggested as an x ray unit for that animal, which corresponds to four to five human erythema doses.

Xeroderma Pigmentosum.—Arnold R. Rich, Wilburt C. Davison and Carl H. Greene (*Bulletin of the Johns Hopkins Hospital,* September, 1924) describe a case of xeroderma pigmentosum, developing at the age of two years, in which the lesion was least apparent over the abdomen, buttocks, and back, and most marked over those areas that are usually exposed to sunlight, particularly the face, the neck, and the backs of the hands. The course of the case demonstrated the unfavorable influence of radium therapy, except for a transitory improvement after the second and fourth treatment. A discussion of the skin lesions is given.

Radiodermatitis and Its Treatment.—Arthur U. Desjardins and Fred L. Smith (*New Orleans Medical and Surgical Journal,* November, 1924) say with reference to the treatments of radiodermatitis:

1. The mode of treatment depends on the location of the burn, the looseness of adjoining tissues, the thickness of tissue, and the blood supply.

2. Hyclorite dressings are exceedingly beneficial in cleansing the wound, and seem to stimulate the epithelium. At least we do not believe that epithelial cells are deterred from proliferating by the dilutions used. Hyclorite is preferable to Dakin's solution, the chemical qualities of which are too inconstant.

3. Sunlight in conjunction with wet dressings is very beneficial.

4. Paraffin dressings permit the patient to get about, protect the wounds, and apparently epithelium grows luxuriantly under it, if the surface is free from bacterial products. The dressing should be changed every twenty-four hours.

5. When a film of whitish exudate appears, the use of the wet hyclorite dressings is indicated, and in the course of two or three days, the exudate will usually disappear. The use of paraffin dressings may then be resumed.

6. In the chronic radiodermatitis of radiologists, halfway measures are pernicious. Early radical measures are safer in the long run, and sentiment should not influence the decision as to treatment.

Production and Significance of Cutaneous Allergy to Pneumococcus Protein.—George M. Mackenzie and Shutai T. Wood (*Journal of Experimental Medicine,* January, 1925) produced by intracutaneous injection of guinea-pigs with an alkaline extract of pneumococcus in about two thirds of the animals an allergy with a skin reaction similar to the allergic skin response of tuberculosis. Continuance of the intracutaneous injections after the appearance of allergy results in its disappearance. The skin ceases to react. Neither the animals manifesting skin allergy nor those in which it fails to develop show any significant alteration in susceptibility to pneumococcus infection by intraperitoneal inoculation. Similarly, animals desensitized by continuing the intracutaneous injections after the appearance of allergy show an unaltered susceptibility.

Insulin and the Skin.—Ernst F. Miller (*Journal of Laboratory and Clinical Medicine,* June, 1924) injected rabbits simultaneously with equal amounts of insulin taken from the same bottle, the only difference being that one rabbit was injected subcutaneously, and another intradermally. A decided difference between the results of subcutaneous and intradermal injection was noted. The effect of an equal dose of insulin is considerably prolonged if given by the intradermal route. The skin as an individual organ is partly responsible for this effect, also the factor of resorption plays an important part, but these factors alone will not explain the phenomenon. Experiments quoted indicate that the fatal dose for intradermal injections may be higher than the fatal dose for subcutaneous injections.

Etiology of Erythema Nodosum.—Benvenuto Coglievina (*Wiener klinische Wochenschrift,* April 24, 1924) states that there is no etiological relationship between erythema nodosum and tuberculosis. Inasmuch as both of these conditions show a predilection for their appearance or exacerbation during the spring and autumn, erythema nodosum may become a provocative of tuberculosis, just like measles, pertussis, and other infections. Experiments with the blood of erythema patients and the punctate of erythema nodules have led the author to the belief that an attenuated scarlet fever infection has some connection with the condition. It is contagious, but to a much less degree than scarlet fever. The rare sequelæ, such as endocarditis, pleurisy and meningitis, must be feared because of their severity.

Present State of Knowledge of the Etiology of Herpes Zoster.—B. Lipschütz (*Wiener klinische Wochenschrift,* February 21, 1924) found cellular inclusions, which he calls chlamydozoa, which findings were also observed by several other investigators. The inoculation of these bodies into the cornea of the rabbit is not possible in every case. The best condition and method of inoculation is not as yet known. The close relationship between zoster and varicella is very significant. Protection from varicella can be accomplished through cutaneous and intracutaneous inoculations with zoster material. If this is found to occur in a large material, there can be no doubt that zoster is an infectious disease.

Leprosy, a Selfhealing Disease.—Ernest Muir (*Lancet,* February 9, 1924) draws the following conclusions: 1. Leprosy is a selfhealing disease, in typical cases of which immunity is gradually produced. 2. Delay in immunity production is due to the nature of lepra bacilli which are able to multiply with few or no signs of local or general toxemia. 3. During the first two stages of leprosy it is most important to restore the lowered tissue resistance, otherwise the disease may pass on into the third stage. 4. In the third stage, where immunity has been produced, it is important to bring about moderate reactions so as to hasten the resolution of the lesions before deformity and disablement can take place. 5. In cases which have passed through the third stage an absolute cure may be hoped for as far, in many instances, as the active disease is concerned; while in cases which have recovered without passing through the third stage the cure can only be considered a relative one, recurrence being possible should the tissue resistance be seriously lowered at any future time.

Etiological Relationship Between Warts and Pointed Condylomata.—E. Frey (*Schweizwische medizinische Wochenschrift,* February 28 and March 6, 1924) states that the common hard and the flat juvenile warts, just as the pointed condylomata, are inoculable and have a probable uniform etiology. The various forms of warts are apparently due chiefly to the histological structure of the site of their origin. The varying behavior of the flat warts may be best explained by a different manner of reaction of the skin as the result of a congenital or acquired predisposition. The following factors speak in favor of the assumption of an etiological unity of warts and pointed condylomata: 1, The histological similarity; 2, the frequently simultaneous occurrence of both the hard and flat warts and of the pointed condylomata in both sexes and in the same individuals; 3, the similar behavior of these structures to certain therapeutic remedies (mercury, arsenic, surgical removal and röntgenotherapy); 4, the inoculability of warts and pointed condylomata and the approximately equal period

of incubation, as well as the transition between the two types of warts and the pointed condylomata following autoinoculation and artificial inoculation, particularly the development of the flat and common hard forms of warts after the inoculation of condyloma material.

Infantile Eczema and Thyroid Insufficiency.—P. Bezy (*Presse médicale,* April 30, 1924) notes that aside from the exciting causes of eczema in infants, such as overfeeding and changes in the maternal milk, there are also predisposing causes, such as tuberculosis, syphilis, and, in some instances, thyroid insufficiency. He reports the case of a child of eight months with severe, refractory eczema and signs of hypothyroidia. Thyroid treatment rapidly relieved both disturbances.

Mongolian Blue Spot with Deformities.—Otto Bruch (*Monatsschrift für Kinderheilkunde,* June, 1924) asserts that the appearance of Mongolian blue spots does not indicate the occurrence of an admixture of Mongolian blood in the ascendants. Inasmuch as the large, pigmented Mongolian cells also appear in the white race during definite stages of the embryonal development, some of the Mongolian blue spots must be interpreted as cases of spontaneous atavism. The frequent coincidence of Mongolian blue spots with other malformations may also be explained as germinal injury, which keeps the organism back to an earlier stage of development.

Repeated Serum Rashes.—A Moussous (*Médecine,* August, 1924) has met with nineteen instances of recurring serum eruptions in the last three years. The condition seems to be far more common than formerly. In fifteen cases diphtheria antitoxin and in four antipneumococcus serum had been used. The first eruption appeared from five to fourteen days after the beginning of serum treatment, and the interval between the first and second eruptions ranged from five to twelve days, being most commonly six days. The amounts of serum injected had, in conformity with present practices, rather large, viz., from 60 to 150 mils, given in the course of two to four days. The eruption was generally polymorphic, and the second rash was not necessarily of the same type as the first. The second was usually the more pronounced and the more apt to be attended with manifestations of serum disease.

Epithelization of the Maxillary Sinus.—J. E. Sheehan (*Surgery, Gynecology and Obstetrics,* September, 1923) summarizes his further report on epithelization as follows: The advantages of epithelization of the maxillary recess after the removal of disease are:

1. That the mucous membrane is replaced by skin which assumes some of the function of the membrane.
2. That the formation of scar tissue is prevented.
3. That weeks and possibly months of irrigations are rendered unnecessary.
4. That the cavity is not packed with gauze and after-treatment is consequently short and not painful, with little local or general reaction.
5. That the skin changes its character after a period of weeks, assuming a pinkish white color.
6. That the patient is returned to a state of health in a comparatively short period of time.

In view of the fact that the subject is still in the realm of experimental work the author firmly believes the results obtained are most gratifying and, in concluding this account of his personal experience in connection with the surgery and epithelization of this recess, he desires to record his conviction that, by fair and constructive criticism, one may advance the methods described to a stage where complete success will be the average prognosis where they are used.

Röntgenotherapy of Skin Diseases.—Herbert Fuhs (*Wiener klinische Wochenschrift,* August 28, 1924) states that the use of the soft röntgen rays that have been found to be dangerous for the skin have been gradually abandoned in favor of the medium hard or hard rays. The same statement applies to the administration of massive doses, which have been abandoned in favor of fractional partial doses. Röntgenotherapy is contraindicated in all acute irritated conditions of the skin and also in cases of skin that has been previously injured by röntgen rays. This form of treatment is indicated for the purpose of epilation (recently for permanent epilation), in some forms of tuberculosis of the skin, in itching dermatoses for the relief of the itching, in eczemas, including the eczema of infants, etc. Irradiation of the thymus has not proved successful in psoriasis.

Radium in Treatment of Vascular Nevi.—F. E. Simpson (*Surgery, Gynecology and Obstetrics,* March, 1924) points out the following advantages of radium treatment for vascular nevi, accompanying this with a list of disadvantages, several illustrations, and a discussion of the technic and methods of radium treatment. Radium is unique in the fact that it exerts a marked action on the bloodvessels of the nevus, other tissues being only slightly or not at all injured. The painlessness of radium is one of its points of superiority over other methods. This factor is of importance especially in the treatment of children. If the method of application is correct, there is very little scar tissue following the use of radium. Contractures seem never to occur—a feature of great importance when angiomata are situated about the eyelids, nose, or mouth.

The cosmetic results are usually superior to those obtained by other methods. As in all cosmetic disorders, the results of treatment naturally depend very largely upon the care and fidelity to detail with which the treatment is carried out. In rapidly spreading nevi and in cases occurring in infants in which the lips are involved and suckling is seriously hindered, life may be saved by prompt radium treatment.

Acne Vulgaris.—G. Gordon Campbell (*Medical Clinics of North America,* May, 1924) considers two indications as important in the treatment of acne vulgaris; 1, to get rid of the comedones already present and to prevent the development of new ones; 2, treatment of the pus infection.

The failure of permanent cures is almost invariably due to the neglect of the first indication. The comedo extractor is the best for this purpose. Bathing with very hot water or steaming over very hot vapor helps considerably. Thorough shampooing of the skin at least once a day with a nonirritant toilet soap removes the overflow of sebum and keeps the orifices of the ducts open.

In treating the pus infection it is imperative to evacuate all pustules as soon after they are formed as possible, to prevent further infection. The whole of the comedo must be removed. The needle most satisfactory for this purpose is a straight Hagedorn. Alcohol is the most reliable antiseptic. To reduce pus formation, bacterial vaccines, either stock or autogenous, are valuable. Staphylococcus albus vaccine, in comparatively large doses, is now mostly used. For the destruction of the pus organisms in the skin röntgen and ultraviolet rays are very popular. Careful dieting and the treatment of gastric disorders are not an essential part of the treatment.

SYPHILIS

Flocculation and Complement Fixation in Syphilis.—E. W. Todd (*Lancet,* July 5, 1924) adduces evidence that the sigma reaction is more delicate than the Wassermann reaction in well treated cases of syphilis and in imperfectly treated cases of long standing, but it appears that reliance solely on either method may lead to a very small proportion of positive sera being missed. In the case of cerebrospinal fluids the sigma reaction appears to have little advantage over the Wassermann reaction, owing to the fact that in the latter reaction a much larger quantity of cerebrospinal fluid than of serum can be used, whereas in the sigma reaction the quantities are the same. From the limited number of primary cases examined it appears that the sigma reaction usually becomes positive before the Wassermann reaction, but occasionally a positive Wassermann reaction is obtained first.

Small Syphilitic Osteitic Lesions of the Cranium Detected with the X Rays.—A. Léri and P. Cottenot (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* April 3, 1924) report one case of epileptic seizures and three of paresis or paresthesia of the lower extremities in which clear cut x ray pictures of the skull showed small lesions of gummatous osteitis corresponding precisely in their location with the symptoms complained of. In one case there was an acquired syphilitic infection, while in two, and probably three, unrecognized congenital syphilis was responsible. In all cases the symptoms were promptly relieved by antisyphilitic treatment, and at the same time the slight palpable irregularities of the skull or unevenness of the inner table disappeared. In the epileptic case the frontal x ray picture showed a pisiform nodule to the right of the midline of the skull with subsidence of the inner table; the lateral view showed this condition of the inner table for a distance of three or four centimetres behind the bregma. Under bismuth treatment, after a single final seizure,

there was no further seizure in five months, and in two months the outline of the inner table was found to have been almost completely restored. Observation of several additional cases have convinced the authors that such conditions are relatively common.

Syphilitic Arthritis with Eosinophilia.—Alan M. Chesney, Jarold E. Kemp, and William H. Resnik (*Bulletin of the Johns Hopkins Hospital,* August, 1924) describe two cases showing the following syndrome: marked enlargement and tenderness of the lymph glands accessible to palpation; acute polyarthritis; eosinophilia; a positive blood Wassermann reaction; fever; and prompt recovery under antisyphilitic treatment. The cases are reported because of their occurrence in conjunction with a syphilitic infection.

Specificity of the Kolmer Complement-Fixation Test for Syphilis.—John A. Kolmer and Edward Steinfield (*Journal of Laboratory and Clinical Medicine,* October, 1924) found that the Kolmer complement fixation test for syphilis shows that it has three outstanding features: a very high degree of specific sensitiveness; an almost total absence of tendency for yielding apparently nonspecific reactions, and a very low percentage of anticomplementary reaction. A study of the reaction in the following conditions is made: experimental trypanosomiasis; leprosy; tuberculosis; pregnancy; diabetes mellitus; malaria; nephritis; icterus; pneumonia, and scarlet fever, with the following conclusions: Falsely negative complement fixation reactions may occur in cases of extremely latent syphilis because of insufficient amounts of "reagin" in the blood and spinal fluid. The incidence of these may be reduced by using a test yielding reactions of as maximum a degree of sensitiveness as is consistent with specificity. Falsely positive reactions are usually due to errors in technic and can be reduced to a minimum by confirming the conduct of the complement fixation test for syphilis to competent serologists unwilling to sacrifice accuracy for mere speed in returning reports or for economy of time and materials. The test did not yield falsely positive reactions with the sera of rats, guineapigs and rabbits with acute and chronic trypanosomiasis, nor does it appear to yield falsely positive reactions with the sera of nonsyphilitic lepers or with the sera of nonsyphilitic individuals suffering with the various clinical conditions listed above.

Syphilis, the Disease of Diseases.—C. Bertram Gay (*Boston Medical and Surgical Journal,* September 18, 1924) gives the following rules as those laid down for handling syphilitics in the Mayo clinic.

1. Individualize the patient. Remember that you are treating a human being not an abstraction.
2. Treat syphilis as a whole and not from the viewpoint of some isolated aspect.
3. Insist upon the combined use of mercury and arsphenamine in early syphilis, the former for spirillicidal effects, the latter for the building and maintenance of the patient's resistance. Emphasize that mercury does not control infectious lesions. Do not encourage rest intervals in the first year of an early case.
4. Taboo mercury by mouth in early cases and the use of a small number of injections of arsphenamine. If the patient cannot be given at least two courses of six injections each by the physician who has charge of him, that physician should send him to some place or agency where he can receive at least this number of injections. Use mercury by inunction and intramuscularly.
5. Emphasize the fact that inadequate early treatment for syphilis, especially the inefficient administration of arsphenamine, is responsible for grave relapses and probably for a steady increase of incidence of neurosyphilis. Insist, therefore, that early treatment shall be both intensive and prolonged. Most early syphilis is undertreated.
6. Discourage the merely symptomatic outlook on the results of treatment. In particular, the disappearance of lesions and the reversal of the blood Wassermann reaction from positive to negative in the first few years of the infection have relatively little significance. Insist that no patient shall be placed upon prolonged rest period or allowed to lapse from observation and treatment in early syphilis until the spinal fluid has been examined and found normal.
7. Emphasize the need for treatment in all patients who show evidences of syphilis, even though that evidence be nothing but a positive blood Wassermann reaction, provided the patient has never been adequately treated before.
8. In late cases of syphilis warn physicians of the danger of injudicious and overintensive treatment, and especially of the premature use of arsphenamine in patients with serious lesions of the heart, liver, and nervous system. Advise mercurial preparations.
9. Take every step possible both in early and late cases to maintain the general health and resistance of the patient and the integrity of the excretory mechanism.
10. Syphilis of the hereditary and congenital type should be treated with the same vigor and by essentially the same methods as late syphilis in adults.
11. Syphilitics should not marry within three years after infection, even when under treatment.
12. Many syphilitics have syphilitic families or contacts. Search out members of these families or the patient's other contacts and endeavor to bring them under treatment.
13. Syphilis must be treated as a whole. It is inexcusable to treat patients merely to control temporarily infectious manifestations. No agency should assume charge of a patient which is not prepared to meet every aspect of his case from start to finish and throughout the patient's life. Followup and observation are as essential as treatment.
14. Technical skill as well as trained judgment are essential to the treatment of syphilis. Emphasize how to do a thing as much as what to do.

Certain Factors in the Diagnosis of Syphilis Unrecognized in the Earlier Years of the Infection.—John H. Stokes and Harold A. DesBrisay (*Canadian Medical Association Journal,* August, 1924) say that the history of a syphilitic infection is a notoriously unreliable guide to the presence of the disease. Obscure onsets, unrecognized primary and secondary lesions, and even absence of clinical primary and secondary lesions as such, must be reckoned with in as high as twenty-five per cent. of the average diagnosed syphilis in medical consultant practice. In women the proportion is much higher. A complete medical and syphilological examination made to confirm or disprove a possibility of syphilis, has even from unpromising material, yielded sixty per cent. of positive results. This examination included the pooled resources of a group practice, plus a provocative procedure, the spinal fluid examination, detailed individual anamnesis, and study of the family.

The margin of syphilis, which, even though untreated, is Wassermann negative in the blood by ordinary technic in a diagnostic practice, is about thirty per cent. The margin of syphilis, diagnosed and undiagnosed, which is blood Wassermann negative in the average consultant practice, may reach fifty-five per cent.

Neurosyphilis is the type which, in our experience, shows a distinct tendency to Wassermann negativity in the blood, and hence calls for fuller testing by other means, especially the spinal fluid examination, to establish the diagnosis in the period of latency, when treatment may yet be of value.

Management of the Neurosyphilitic.—G. Orville Scott and Gerald H. J. Pearson (*Canadian Medical Association Journal,* August, 1924) say that the prognosis of mesodermal neurosyphilis is good both as regards relief from inflammatory symptoms and eradication of the disease. In degenerative myeloencephalitis (tabes) a few cases are hopeless, the remainder showing great clinical improvement and in a majority arrest of the disease. In degenerative encephalomyelitis (paresis) a larger percentage are hopeless but in a small majority marked amelioration is obtained and in a moderate number arrest of the process. The earlier a case of neurosyphilis is placed on proper treatment the greater the probability of cure. Without question the time to treat neurosyphilis is before clinical signs, with their indication of a possible permanently damaged neuraxis, appear. Adequate treatment of primary and early generalized syphilis is the treatment *par excellence* for neuroinfection.

No patient with symptomatic neurosyphilis should be assured of cure, but should be told that though the disease can be arrested, evidence of destructive lesions will be permanent. Neither should marriage be permitted unless the other party is acquainted with the condition, not because of the danger of transmission of the disease but because a further development may lower the patient's earning capacity. It is improbable that clinical neurosyphilis can be cured but the disease may be arrested in a large majority of cases, amounting to eradication in the mesodermal and early degenerative types and to a great improvement in the late parenchymatous varieties.

FRACTURES

Chauffeur's Fracture.—J. Grossman (*American Journal of Surgery,* November, 1924) urges that the term "chauffeur's fracture" be dispensed with, as it does not designate any specific type of fracture. He presents cases showing seven different varieties of fracture which all resulted from the same cause, namely, cranking motors.

Sectional Plaster of Paris Casing in Fractures and Fracture Dislocations.—W. A. Cochrane (*British Journal of Surgery,* October, 1924) offers the following conclusions:

1. Fractures of the bones of the leg and fracture dislocations of the ankle present difficulty, not in the actual reduction of the fracture, but in the maintenance of the corrected position while immobilization is being secured.
2. A precise, accurate, simple, and practicable method, in the form of a plaster of Paris casing applied in two or more sections, is available. The device is based upon the three piece sectional plaster method employed by Fiske in the treatment of congenital club foot.
3. The process of wedging makes fine adjustments possible, especially with reference to angular deformity.
4. In the writer's opinion and experience, the sectional plaster of Paris method should be the method of choice in all cases with displacement, where immediate reduction and fixation are indicated.

Experimental Study of Ununited Fractures with Especial Reference to the Inorganic Bone Forming Elements in the Blood Serum.—Henry A. Petersen (*Bulletin of the Johns Hopkins Hospital,* November, 1924) studied the healing of fractures in dogs on diets containing an adequate and an inadequate amount of calcium and phosphorus. The calcium and phosphorus product is much higher in the dog than in man. The calcium content is about the same, and that of phosphorus much higher.. Dogs placed on a deficient diet show chemical changes in the serum of the older animals first, though the final result of the diet is the same in all animals. The time required for the reduction of the phosphorus to a point at which fractures would not unite was from nine to twelve weeks. Once the calcium and phosphorus product has been reduced, and fractures made, nonunion invariably was the result. When the animals were placed on an adequate diet, the fractures united.

Fractures of Upper End of Humerus.—H. E. Santee (*Annals of Surgery,* July, 1924) from a number of cases deduces that fractures about the neck of the humerus occur mostly beyond middle life. The resulting disability is usually marked and prolonged. It is done mainly to the associated injury of soft tissues about the site of fracture. Wide abduction and external rotation is the position of choice for convalescence. Such position in a number of cases must be attained gradually. While recognizing the value of various types of ambulatory splints, I feel that the conditions here encountered are best and most comfortably met by bed and traction suspension treatment with a frame. Massage and physiotherapy are aids in treatment, but the best and quickest results reward the cooperative, intelligently active patient. For this reason women who resume their household duties early seem to regain function and strength more rapidly than men.

Fractures of Shaft of Femur.—W. DeWitt Andrus (*Annals of Surgery,* December, 1924) recommends a balanced traction method for treatment of fractures of the shaft of the femur in adults on the following six counts.

1. Its application can be carried out almost painlessly without anesthesia.
2. It possesses all the advantages of skeletal traction with none of the disadvantages of the latter method and can be used in certain cases, such as those associated with marked swelling of the knee joint in which the use of skeletal traction is attended with considerable risk.
3. The traction alone, if properly applied, suffices to accomplish the reduction and fixation of the fracture in the large majority of the cases; eight of the eleven in this series.
4. It permits the patient to move about in bed to a considerable extent without pain and without disturbing the force or the direction of the traction. The nursing care of such patients is therefore made much easier.
5. It can be successfully carried out in cases in which other methods fail or are not tolerated and in which open operation is contraindicated, due to the physical condition of the patient, as in two instances in this series.
6. There is less stiffness of the knee and less muscular atrophy following the use of this method than when casts alone are used.

The method is described as follows: The leg is carefully shaved and cleaned with alcohol and ether and the malleoli protected with pads. Traction straps of zinc oxide adhesive plaster are then applied to the leg below the knee and fastened to a wooden spreader provided with a cord which runs over a pulley at the foot of the bed. To this cord is attached a weight which varies according to the age and the physical condition of the patient, but is usually from twenty to twenty-four pounds in a robust individual. A sling which extends from a point just below the head of the fibula to the malleoli is then placed about the calf of the leg and provided with a rod from which a cord passes through the lower pulley of the "traveller" of the fracture frame and over another at the foot of the bed. The system is so arranged as to make the pull on the sling act at right angles to the pull on the traction straps and with one half its force.

The resultant of these two forces acts at an angle of thirty degrees with the horizontal—or directly in line with the axis of the femur with the leg in semiflexion—and is equal to the square root of the sum of the squares of the two forces. If equal amounts of weight be attached to the sling and traction straps, forty-five degrees of flexion is obtained. Thus by varying the amounts of weight we are able to vary the force of the pull and the degree of flexion to suit the requirements of a given fracture. When the upper fragment is abducted, as in many fractures of the upper third, the traction is applied with the leg in about thirty degrees of abduction.

Another sling is placed about the thigh, from which a cord runs through the uppermost pulley of the "traveller" and over the head of the bed. To it eight or ten pounds of weight is attached. This sling serves at least two purposes. In fractures of the lower third it tends to draw the upper end of the distal fragment forward into alignment with the upper fragment. In all cases it acts as a coaptation splint which supports the thigh and prevents sagging of the fragments posteriorly due to gravity. Foot drop is prevented by traction applied to the sole of the foot, the traction cord with its attached weight running over the middle pulley of the "traveller." In fractures of the lower third this may be omitted for the first two or three days to obtain a better relaxation of the gastrocnemius. Counter traction is obtained by raising the foot of the bed about eight inches from the floor.

Fractures of Shaft of Femur.—W. C. Campbell and J. S. Speed (*Surgery, Gynecology and Obstetrics,* November, 1924) submit the following conclusions:

1. Fractures of the shaft of the femur in children properly treated give excellent results.
2. Callus in children is usually exuberant, and nonunion even in the presence of infection or malposition is rare.
3. Young growing bones have the ability to correct even marked deformities.
4. Immediate reduction and plaster cast is the ideal method of reduction in children because of the uniformly good results, the ease of handling and caring for the patients and the certainty that lack of cooperation, on the part of the child, cannot displace the fragments, as often happens with the traction treatment.
5. In adults the plaster method, properly used, gives us as good, or better, results than any other method.
6. Simple fractures should be reduced immediately after injury.
7. Early mobilization of joints and massage of the soft tissues is of great importance in all fractures, but satisfactory reduction and union should not be endangered by too great an enthusiasm in this respect.
8. Compound fractures of the femur will heal without infection in fifty per cent. of the cases.
9. Nonunion is due chiefly to malposition.
10. Open reductions are rarely indicated in acute fractures of the femur.
11. Autogenous bone grafts are the best method of internal fixation in connection with open reductions; internal fixation is rarely indicated in children, even in nounions; it is indicated in malunions in adults, when reducton is difficult to maintain, and always in nonunions in adults.
12. Fractures of the femur give long periods of disability and unless properly treated are liable to result in permanent impairment.

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Medicolegal Notes.

VACCINATION AS A CONDITION OF SCHOOL ATTENDANCE

The Supreme Court of Illinois holds, Burroughs v. Mortenson, 312 Ill. 163; 143 N. E. 457, that "vaccination is not a condition precedent to the right of a child to attend a public school, and cannot be made such condition either by a board of education or a board of health. The superintendent or other officers may not arbitrarily exclude from the schools a child who has not been vaccinated and refuses to be vaccinated. By rules and regulations adopted by the board, the vaccination of school children may be required in case smallpox is epidemic in the vicinity of the school or danger of an epidemic may be apprehended."

The Legislature has, by section 1, article 5, of the Cities and Villages Act, authorized cities and villages to appoint a board of health and prescribe its powers and duties, and to do all acts and make all regulations necessary or expedient for the promotion of health or the suppression of disease.

VIOLATION OF HARRISON ANTINARCOTIC LAW

The Circuit Corut of Appeals, Fourth Circuit, holds, Newman v. United States, 299 Fed. 128, that a physician cannot justify giving or selling morphine to an addict to gratify his desire for the drug, on the claim that it was given in the course of the physician's professional practice.

The Circuit Court of Appeals, Sixth Circuit, holds, Hobart v. United States, 299 Fed. 784, that the issuing of prescriptions for large doses of morphine at frequent intervals, to a known addict, who was not under restraint, was a violation of the Harrison Antinarcotic Act.

INSUFFICIENT PROOF OF MALPRACTICE IN OPERATING ON MAXILLARY BONE

In an action for malpractice, in which it was claimed that defendant was negligent in cracking or breaking the superior maxillary bone while operating for an infection of the left antrum, it appeared that, while the defendant did not discover the original source of the infection when making his diagnosis, neither could nor did the many other physicians of admitted skill and experience in that vicinity during their observations and treatments of many months. These others had the same opportunities for discovery that were possible to the defendant, and he could not be said to have shown a failure to use the reasonable care and skill which the law requires. The Wisconsin Supreme Court therefore held, De Sham v. Taugher, 198 N. W. 268, that the evidence warranted the trial court's refusal to submit to the jury the question whether the defendant was negligent in making the diagnosis.

It was also held that a finding of negligent breaking of the superior maxillary bone could have been supported only by that part of the testimony of a specialist who subsequently treated plaintiff to reduce a swelling under the right eye to the effect that if an instrument such as the defendant testified he did use had been used in a manner unusual and unnecessary for such an operation, and force had been applied to it, using a portion of the bone as a fulcrum, there could have been produced a break or crack in the superior maxillary; and that such a finding, if made, could not have stood. It would have been purely speculative, under the evidence, as to whether any such force had been so negligently applied. By this specialist's further testimony it became pure conjecture whether the bone fragments which he removed had become detached by pressure from some instrument or by pus action. In such a situation it was held that the plaintiff had not supplied the quantum of proof the law requires in order to establish liability of a defendant in this class of cases. Furthermore, it was held that it would be inconsistent with the undisputed fact that there was infection already present before defendant performed anything in the nature of an operation upon the plaintiff, and which infection, under the undisputed evidence, might have accounted for all of the unfortunate sequence. Judgment directing a verdict for the defendant was therefore affirmed.

CAUSE OF DEATH THE ACCELERATION OF DISEASE BY INJURY

In an action for death, alleged to have been the result of a collision between a buggy in which deceased had been riding and defendant's automobile, it appeared that the deceased died of Bright's disease two months after the action, that the disease had its origin prior to the accident, and that it was an adequate and probable, if not inevitable, cause of ultimate death. The only evidence of any discovered injury on deceased's person after the accident was the appearance of an abscess three days before her death. It was undisputed that this was consistent with the progress of the disease.

The Iowa Supreme Court, Pentony v. Dudley, 198 N. W. 78, held that the burden was upon the plaintiff to show, not merely the accident, but also some injury which was adequate as a probable cause of aggravation of the existing disease or acceleration of its fatality; and that the evidence failed to furnish any basis, either for expert opinion or for the finding of the jury that the alleged injury aggravated the disease or accelerated her death. Opinion or finding to that effect upon the record was held in a legal sense a mere surmise, and judgment for the plaintiff was reversed and the case remanded for a new trial.

TRANSFER OF PROPERTY OF MEDICAL COLLEGE TO UNIVERSITY

The Trustees of the Rush Medical College filed a bill requesting that it be directed to transfer its property to the University of Chicago in accordance with an agreement with the university to carry on the work of the college, the latter finding itself, because of changed conditions, unable to continue its usefulness, owing to the fact that its buildings and equipment were out of date and its facilities for instruction, according to modern standards, were inadequate, and that it had no funds with which to correct the situation. The Supreme Court of Illinois held, Trustees of Rush Medical College v. University of Chicago, 312 Ill. 100, 143 N. E. 434, that "the transfer of the property of the college to a similar charity under conditions which assure continuation of the use of the property in accordance with the purposes of the charter of the college, so that the fulfillment of the charitable purpose will be accomplished, and the efficiency of this educational institution increased, is not a diversion of the funds to a purpose foreign to that to which they were dedicated." Decree for complainant was therefore affirmed.

JUDGMENT FOR NOMINAL DAMAGES FOR MALPRACTICE REVERSED

In an action for malpractice it was established that defendant surgeons inadvertently left a gauze sponge within the incision after the removal of a kidney. On the point whether injury resulted from this there was much conflicting evidence. The jury rendered a verdict for plaintiff, awarding him, however, only nominal damages. The Kansas Supreme Court, Russell v. Newman, 226 Pac. 752, two judges dissenting, reversed judgment thereon, holding that the leaving of the sponge in the incision undiscovered for 70 days must have resulted in substantial damages notwithstanding the testimony of physicians to the contrary.

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The Eugenic Program—How Far Is It Practical?

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The socalled science of eugenics, which has for its large object the improvement of the human race, has in recent years attracted the interest and enlisted the support and energy of a growing number of persons and organized societies throughout the world; and the recent International Congress on Eugenics held in New York bears witness to this widespread interest. Oddly enough the medical men have not exhibited the interest in this subject which is in keeping with our numbers and the importance of the subject. However, an increasing number of leaders in our profession have investigated the subject of late, among them Dr. Lawrence Litchfield and Dr. William Allen Pusey. The medical profession may now well ask itself what, if any, attention and interest shall it pay to this subject, and what, if any, method of investigation shall it inaugurate?

In *Mankind at the Crossroads,* Professor Edward East, of Harvard University, goes over the whole subject; and since he, I believe, pretty well represents the nonmedical point of view, a very brief review of his book may best serve my purpose in introducing the discussion of the subject on my own part.

Professor East tells us that whereas there were five million persons in the United States in 1800 there are now one hundred and ten million, and while in 1800 the population of the world was fifty million it is now one billion seven hundred million; and in another two hundred years there will be five billion persons in the world—the limit of population it can support. He refers to the intelligence test conducted by the army and accepts the conclusion that there is a large percentage of incompetent and subnormal persons in this country. He points out the decrease in the birth rate and the decrease in the death rate, which he says about balance each other. It is well known that the incompetent members of the community are increasing far more rapidly than the biologically competent members. The human race is to be improved by teaching fully and completely the doctrine of heredity, and men and women must be taught how better to mate with regard to the production of offspring. The mentally unfit must be segregated or rendered incompetent by castration.

His main argument, however, to which he returns over and over again, is the subject of birth control. The facts must be spread before the people and then the biologically competent must produce more children and the biologically incompetent must produce less. The whole thing is one of education and the taboo of theology and the fantastic law enacted through the influence of Anthony Comstock, must be repealed so the way may be cleared for a campaign of birth control which must be nationwide, indeed worldwide. It can succeed only by united action.

And then Professor East, after going through twelve long chapters in 351 pages, concludes his book with these significant lines: "Today the finest families are hardly replacing themselves. The incompetent are taking their place. And this will continue should there be no eugenic reform until that point of equilibrium is reached where no more dolittles can be accommodated. . . . Half the people in the world lack sufficient brains to cope with the intricate system of social life the industrial age has brought about. . . . Knowledge to prevent the decay of our social fabric is not wanting; but it is a serious question whether there is the required amount of that type of ability which will make a sustained effort to apply it."

Thus it appears to me his argument is academic, utterly lacking in force, indeed, selfcontradictory. After convincing himself and attempting to convince his readers of the vast amount of mental incompetency there is in the world, he then advocates a program which requires great mental competency on the part of the community. And sadly enough the very last word of his book is a weak one and one of doubt. He asks, "Is there the required amount of ability to make sustained effort and apply our knowledge?" Here, like many pedagogues, Professor East makes the highly erroneous assumption that if we know a thing we will do it. Whereas every student of Nature knows that with knowledge and ability a thing is not done unless there is a *desire* to do it. Everywhere he speaks of knowledge and ability, where he should speak of desire.

Recently I have read many books and reviews on the subject of eugenics; the familiar argument appears to be repeated in all of them. The unfit must be eliminated. This is to be done by a knowledge of heredity, the desire for better children, segregation or sterilization of the unfit, and above all, birth

*Read before the Pittsburgh Academy of Medicine, December 23, 1924.

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control. For instance, one author writes a long paper in which he argues that "All superiors should mate" and he adds, "with each other." Thus finally he would eliminate all of the unhappiness in the world. He warns against selection on the basis of beauty and vivacity alone and brings to the fore, poise, endurance, stability and judgment. He denies that a man marries an inferior that he may retain his leadership, but says the more capable the mate the more stimulating. Making against selection of high grade parents is the training of young women in colleges when they are at the impressionable age when marriage commonly takes place. To overcome this the author suggests all colleges shall be coeducational so the fit may thus select the fit. Another writer suggests that a eugenic bureau be established in every town to furnish a eugenic history to men and women contemplating marriage. So it goes. And more like this.

While we have heard a good deal of birth control in this country it would appear that the subject has been discussed much more largely and with greater warmth of feeling in Great Britain. The *British Medical Journal* says: "A conviction has steadily grown that the advocates of conception control and their opponents are for the most part tedious writers, only to be tolerated if the views they uphold or denounce with so much vehemence are really of first rate importance." Many of the articles seem so fantastic, many of them are so dull by repetition of articles before them, that I can understand very well our sensible British friends becoming wearied of the whole subject. However, I wish to pay a tribute to Major Darwin (son of Charles Darwin) who presided at the Eugenic Congress and who apparently appreciated the whole situation and trend of the discussion and solemnly warned against impractical visionary and fantastic programs. He himself only felt sure of his ground that it was wise to stress the subject of heredity and its great and significant importance. He said we could be sure of our ground in trying to teach teachers that in mating people should take into consideration health, heredity and the possibility of offspring.

The subject of birth control was discussed by Dr. Pusey last June in his presidential address before the American Medical Association. He expressed sympathy with the desire that by better breeding the race should be improved. He then said: "I desire particularly that the mistaken impression should not go out that I mean to say that medicine now has any satisfactory program for birth control. It has not."

Recently the Committee on Maternal Health of the New York Academy of Medicine has been investigating this whole matter, basing their inquiry upon the findings in several hospitals in which five thousand cases were considered and a study of the literature. This report is noteworthy and one which medical men may well consider. This committee states that there has been no investigation of birth control made in a scientific or ethical spirit approaching the subject without bias. It also states that in Holland, which is so often quoted as the paradise of birth control, it is "without clinics, clinical reports or consensus of opinion." The committee concludes that the medical profession does not yet know any guaranteed contraconceptive. Now Mr. Udny Yule comes forth in an editorial in the *British Medical Journal* in which he makes the statement, based on studies both British and American, that the growth of population is a biological selfregulating process; indeed a process in which regulation is extraordinarily sensitive. "This conclusion rejoices the *British Medical Journal,* which hopes it is true so that advocates and opponents of birth control may be left to talk to themselves and let other people alone who are weary of the subject."

We must remember at the outset of any discussion on eugenics that while the human race is subject to biological laws, it is, whether we like it or not, also tied and under the guidance of moral, religious and political laws, and these to some extent contravene biological laws. So in any discussion of the improvement of the human race we must bear this in mind. If it were possible to consider the matter from a biological viewpoint alone, without moral or political considerations, one would immediately without reserve advise the killing instead of the segregation of the unfit. Thus the problem of the propagation of the unfit would be largely solved in the beginning. But as things actually stand in organized civil society, there is unanimous feeling against taking the life of anyone except rarely for crime, no matter how incompetent or how incurable they may be; and then there is unanimity that abortion must not be committed except rarely in certain circumstances where the life of the mother would be jeopardized. These are things for which society, the church, the state and the medical profession stand with great unanimity.

But when we come to birth control, we do not find anything like this same unanimity. And in view of the evidence we have at the present time the medical profession ought to go very slowly in this matter and not be hurried or pushed into it by enthusiastic social workers or humanitarians. It is a serious matter to take human life in being; it is a serious matter to produce abortion; I submit it is also a very serious matter for a physician or social worker to undertake to tell men and women when and how many children they may have. It seems extremely doubtful that this can be done; and if it could be done, it would seem to me it would be a thing we ought not to attempt to do. We must bear in mind that the question of birth of children in the family, while a medical matter, is also far more than a medical question. It is a political question, it is an economic question, and a moral question. It would be well for us to bear these facts in mind in any discussion of this matter.

Moreover, I feel that when the medical profession speaks on this subject it should be with unanimity, like that in which it speaks now on the subject of abortion. By all means let us discuss and investigate, especially along the lines indicated by the New York Academy of Medicine; but for the present let us bear in mind Dr. Pusey's admonition that medicine has not now any safe program for birth control.

The tendency of society today is to promote what Fauget calls the cult of incompetence, that is, the tendency to foster mediocrity at the expense of competency. Society carefully conserves the weakling and the incompetent of all sorts. We have our jails and our hospitals for the insane, the crippled, the

blind and the deaf. And in recent years society has entered upon a much larger program, and social workers of all sorts care for the aged, the mothers, helpless children, etc. In these socializing forces I believe there is danger, grave danger. There is the danger that the persons helped will expect more and more help and to lean more and more. Since we are committed to the policy of caring for the unfit, we ought, for their sake and for our own, to call some reasonable halt on the number of things for which help may be given and the extent to which help may be extended the unfit. Dr. Pusey points out this thing has developed so that for eleven workers over sixteen years of age one is supported as an employee.

Well, what can be done in the matter of improvement of the human race? Can anything be done? Personally I believe with Dr. Pusey the law of the survival of the fittest cannot be greatly modified, nor long set aside, and I am strongly disposed to accept as correct the view of Mr. Yule that "the growth of population is biologically a selfregulating process. Then what is practical and workable in the eugenic program? It is not practical to terminate the life of the unfit, nor is it practical to perform abortions on unfit women, nor is any program of birth control, which has been suggested, practical. But I believe with Major Darwin that it is practical to teach teachers more fully the value of health, and the great value of a selection of healthful partners with regard to the matter of offspring. The biologically fit should be encouraged to mate and beget children. While I do not expect much from this, I think it may help a little. Segregation and castration of the grossly unfit has been proposed. There is a widespread feeling against castration; it would appear that it is practically a dead letter law in the states where it has been passed. It is a thing to be advocated perhaps; but the good accomplished by it must be infinitesimal.

There is much larger hope for the good effect of the segregation of imbecile and feebleminded women of childbearing age. The State of Pennsylvania has begun a program providing for this very thing. It has established an institution at Laurelton for feebleminded women of the childbearing age. This institution now accommodates actually three hundred women and I am informed by those in authority that three thousand women in the state could well be placed there to the advantage of the Commonwealth. Here is a eugenic step that appeals to me strongly as not being visionary, but most practical, and which is not likely to promote discussion engendering heat without light. Let us use our influence, so far as we have it, with the next Legislature to provide means to expand this excellent institution, so that it may accomplish this good thing for which it stands.

But there is one thing further which is not often discussed in eugenic programs, which I believe is one of great practical importance for our own country, and that is, the subject of immigration. Heretofore, our immigrants have come from northeastern and central Europe, whereas in recent years they have come largely from southwestern Europe, a far lower grade of people, generally speaking, as indicated by their appearance, conduct, and by intelligence tests which have been made. I believe, as medical men, we can support in general the restrictions which our government has established and I would even go further and allow a greater increase of immigration from northern Europe from races which are akin to the old stock in this country, I mean those from the British Isles, Scandinavia, Holland, Germany, and Switzerland.

SUMMARY

1. While there is much that is fantastic and visionary in many measures proposed in the name of eugenics, the thing for which it stands—improvement of the human race—deserves and should enlist a growing interest in the medical profession.

2. Among things impractical in eugenic programs in civilized society are these: a, killing of the unfit; b, promotion of abortions; c, birth control.

3. Plans that are feasible and practical today and which should enlist the sympathy and aid of the medical profession are: a, teaching of rules of health and heredity as regards mating; b, encouragement of the fit to mate and the unfit not to mate (very little may be expected from this); c, segregation in institutions of feebleminded women of the childbearing period; d, support of our present immigration law and the use of our influence to bring to this country the people of north and western Europe and especially those that speak the English language; discouragement of immigration from southern and eastern Europe.

The Outlook for the Tuberculous Patient*

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Perhaps it is presumptuous to attempt to give any opinions regarding the future of anything scientific, yet there are certain signs clearly imprinted on the pages of the past that may guide us in making a few statements regarding the possibilities and even some probabilities concerning the trend of events in tuberculosis work. Disclaiming anything that has the appearance of prophecy, let us review the past of tuberculosis and ascertain what bearing it may have on future developments.

A very significant fact regarding tuberculosis is that it has been with the race since remote antiquity. How far back we do not know exactly. Moody (1) produces evidence of an unquestionable Pott's disease in a skeleton of the Neolithic age and regarded by Bartels as the oldest specimen of that disease. There is another reference (2) to a mummy of a priest of Ammon in Egypt about 1000 B. C., where Pott's disease was associated with a psoas abscess. During very early history there are numerous references in Chinese, East Indian, Hebrew, and Greek

*From the Municipal Tuberculosis Sanitarium, Chicago, Ill.

literature which indicate beyond question that the disease was well disseminated by the beginning of the historic era. From these meagre data we may speculate that during the glacial periods perhaps, or later, when man first began to congregate in caves and shelters, tuberculosis came in as Nature's rude protest against such an unnatural mode of life; at least unnatural for men who had been reared in open air and sunshine. Indeed we may draw a direct analogy in recent times. The North American Indians, even after a thorough contact with the white race, did not begin to develop tuberculosis until they began to forsake their native customs. Benjamin Rush (3) as late as 1794 states that "pulmonary consumption is unknown among the American Indians." The committee appointed by the National Association (4) October 28, 1921, to investigate tuberculosis among the North American Indians reported that the Indians have undergone a gradual tuberculization due partially to the depletion of their wild food supply and an enforced change of habits of living resulting therefrom. There were other factors, such as a lack of immunity, but the big thing was the change from the outdoor to the indoor life, with insufficient food.

Through this lapse of many centuries, tuberculosis has been a constant associate of man, sometimes gaining, sometimes losing, but on the whole entrenching itself into the most remote corners of the earth. It has been active since historic times almost in proportion to the activity, congestion, and industrialization of civilization. It is certainly an unpleasant but truthful statement that it is a child of civilization. The fact is, that civilization carries with it certain requirements of mutual association and contact that enhance the growth of destructive microorganisms, which was not provided for in the early development of the race. It remains now for the race to meet the emergency in the new environment and in the rapidly changing environments of the future.

From a retrospect of the long drawn out back and forth struggle of tuberculosis and man, no one is so optimistic as to predict a cessation of the conflict in the near future. First of all, we must admit that it will be a fight to the finish against a deaf and dumb foe. We must also admit that even in the most scientifically regulated communities, such as the Framingham experiment (5), that the disease is not yet completely controlled. If such is true, how about the remote communities, in which little or no effort is made toward control? We know that the world is rapidly becoming more congested and more industrialized, and against this we must make a continual realignment of our forces to meet the changing situations. We know that intemperance, exhaustion, overwork, and dissipation are predisposing factors and that it is only a meagre minority who follow strict hygienic rules of living. We know that privation, hunger, and worry also cause it, but the "poor will be with us always." Furthermore, we know that diseases of many sorts play an important rôle, but when are we to be free from disease? Finally, assuming that every community will eventually be able to wipe it out by a combined effort, we shall continually experience social and political upheavals that will unbalance and disorganize the forces that control it, and may even result in an armed conflict which at the best is worse than all the atrocious conditions aforementioned.

Starting then with the idea in mind that the tuberculosis fight is to be a long one, let us take up one by one the factors which play a rôle in the struggle.

NATURAL DEFENSIVE MECHANISM

Even before the race knew what the disease was, natural means of defence against the infection were being developed, first, by an attenuation of the virulence of the microorganism, and secondly, by an increased immunity of the individual, which after a generation or two is transmitted to succeeding generations and may be termed racial immunity.

ATTENUATION OF VIRULENCE

As to the attenuation of the virulence of the organism we have an analogy in certain other infectious diseases, which gives us some hope. Syphilis does not seem to be as virulent as in the days of the "Neapolitan scourge." Neither does leprosy appear to produce the disastrous results that are described in ancient writings. While we have evidence that tuberculosis on the whole is not perceptibly losing its virulence, there are isolated instances where the bacillus has gradually retrogressed until it has become a saprophyte. The original R.1 of Trudeau is such an organism and everyone working with the tubercle bacillus has noticed that after about two years of artificial cultivation it begins to require increasingly larger doses to kill guineapigs, until after seven to eight years it will produce only local tubercles. But so long as the organism is transmitted from host to host, as tubercle bacilli are, there are rare cases of attenuation of virulence. Corper (6) found only three per cent. of bacilli isolated from specimens of pulmonary tuberculosis of reduced virulence. Griffith (7) in his splendid reports on the bacteriology of various forms of tuberculosis has shown that the organism appears to lose its virulence only when it becomes localized in the skin, bone, glands, etc., for any period of time, but less than one per cent. of internal infections were of reduced virulence. These external types of infection are rapidly disappearing, due to protection afforded by food inspection and surgical measures, so that the pure pulmonary forms are predominant and therefore it appears that the virulence of the tubercle bacillus will be sustained indefinitely.

IMMUNITY

Space will not permit complete details of the immunological phenomena resulting from the ordinary infection as contracted, both on the individual and his progeny. There is no doubt, however, that such immunity is the saving grace of the human race, for without it, especially when no modern sanitary measures are used, races perish when once inoculated with the tubercle bacillus. After infection, aborigines will present an acute "infantile" type of disease and will succumb rapidly with a generalized infection. Some immunity is being conferred, however, for after a generation or two the infection does not run such an acute course, but assumes more the "adult" type of disease or in fact may produce only localized glandular lesions which in turn give added protection to succeeding infections. Therefore by a

subtle method Nature has immunized the individual and has gradually added immunity to his offspring until the race itself becomes partially protected, so much so, that the infecting and disease producing dose is larger, the course of the disease is wholly changed, and in most immunized races about one per cent. of the infected succumb and only about ten per cent. of these die.

NATURE OF INFECTION

In order to understand properly the reasons for these phenomena, it will be of assistance to explain briefly tuberculosis infection. It is now pretty generally agreed that most people are infected in childhood. Krause (8) has compared the work of Hamburger and Pirquet in Vienna; Mantoux in Paris; Moro in Munich; Veeder in St. Louis, and Armstrong and Bartlett in Framingham (Mass.), and has shown the striking similarity of their results, which demonstrate in a not uncertain way that city folks are infected very young. Ghon (9) in Europe and Opie (10) in America have corroborated this pathologically. In addition there is much more to this early infection than an acquisition of the bacilli. Therein lies the basis of much adult disease; according to the Von Behring theory most of it. There are many others, among whom is Bushnell (11), that subscribe to this theory wholly or in part. Krause (12) feels that this point is not adequately proved although no doubt a great part of adult infection arises from a flareup of the childhood infection instead of "reinfection from without." Instead of the dust, droplet or milk infection predominating, Krause feels that much childhood infection is acquired from raw sputum from obscure cases of tuberculosis. This is sound doctrine. Just as the races that are in closest contact and in the greatest activity become infected, the children represent this activity squared. They are here, there and everywhere. If a consumptive even touches any furniture with contaminated fingers, the child has numerous chances to touch this same place and subsequently transmit the infection to its own mouth. Those who understand bacteriology, can readily see that in an open case, where the patient is passing bacilli over his lips by the billions every time he expectorates, a few are bound to stick to the lips and be wiped off on the fingers, to be transferred to the furniture or other objects.

Nothing has been said of the numerous things that may modify these early infections. Without going into the various phases of environment, so admirably given by Krause (13), we shall mention a few of the more general factors that influence infection and immunity in tuberculosis.

SUSCEPTIBILITY TO INFECTION

There is a great variability of susceptibility to tuberculosis in different age groups which we shall consider briefly. Tuberculous infection from infancy to old age runs a progressive course in the socalled immunized peoples. The infant has no allergy and for some unknown reason its lymphoid tissue does not respond to the toxins of the tubercle bacillus so the bacilli after once getting into the lymph stream of the lungs passes readily through and will form tubercles in distant parts of the body, having a tendency to form general miliary tuberculosis. As the child gets older, three to thirteen years of age, its lymphoid tissue appears to react more and thus do we get the glandular types of childhood. The hypermotility of the pulmonary structures assist in mobilizing the organisms in the gland depots. Then from thirteen to twenty years, there is the development of allergy together with a decreased lung motility which tends to arrest the bacilli in the lung parenchyma near where it first lodges and the adult type of disease results. In old age the allergy seems to be present, but there seems to be a tendency to call death due perhaps to poor circulation that enhances the growth of the tubercle bacillus.

INFLUENCE OF INDUSTRY

Another major factor is the influence of modern industry. This question is ably dealt with by Collis (14) who states that the death rate in Sweden during the early part of the last century was relatively low and the time of maximum incidence was fifty years of age or over. But when modern industry and better means of communication came in after 1870 the death rate rose considerably and the age incidence was shifted more into the young adult life from which the greater portion of the laborers are drawn. Similar statistics for Ireland, Scotland, England and other European countries are given and all indicate the profound influence that industry bears on tuberculosis incidence. To clinch the argument he uses the figures of incidence for females during the war in which the increase is very striking.

The converse of industrialism, or agrarianism, may be cited as a factor having a beneficial influence on infection. This is borne out by statistics from the agricultural districts of North America where the death rate falls far below fifty in a hundred thousand.

Finally, we wish to mention the influence of starvation upon large masses of people. Witness the increased death rate in Germany following the war where the immunity was certainly not greatly different than before, yet as Emerson (15) points out, because of privations and a break down of their organizations, the death rate from tuberculosis almost doubled for a time. Conversely, the nation that has the best tuberculosis organizations and is the best fed will produce the lowest death rate, all things else being equal.

NATURE OF IMMUNITY

The greatest significance, however, of infection in general and particularly of early infections is that they confer a hypersensitiveness or allergic properties to the cells of the host that bears a quantitative relation to the liberated tuberculotoxins until the organism becomes overwhelmed. This allergy accounts for the Koch phenomenon, the focal reaction and numerous other phenomena of tuberculosis. No mention is made of humoral specific antibodies because they do not assist materially in the defence of the organism in tuberculosis. Therefore we may disregard them.

In order to make these phenomena as clear as possible in a few words, the work of Krause (16) may be cited because it embodies nearly all the principles of earlier work. As a sort of summary, we

may state that the inoculation of an already infected individual will cause a "focal reaction" tending to liberate toxins from the foci of infection which may cause various results depending on dose, environment, and the amount of infection present. In small doses a previous infection tends to prevent the spread of subsequent infections, but with large doses and with active disease present, there will be sloughing at the site of inoculation and the focal reaction will be so violent that in active cases the tubercles will be broken down and the disease will take on an exudative character. With small doses, however, in sensitized subjects reaction develops at the point of infection, an inflammatory capsule will result and the bacilli retained locally where a local tubercle will be formed and the bacilli kept from spreading until they are destroyed. This is what happens in the vast number of persons who become immunized by infection, yet the protection is not enough to insure against massive doses and is not enough to prevent the primary infection from slowly smouldering into activity under provocation. Furthermore, these individual infections gradually confer more protection until the whole race eventually acquires it.

RACIAL IMMUNITY

As mentioned before, primitive races gradually became tuberculized with a corresponding change in the type and severity of the resultant infections. Drolet (17) has shown recently that the offspring of the tuberculous are less prone to contract the disease than are other people, thus confirming the belief that infection confers defensive properties that are transmissible to the offspring. This apparent increase of resistance when considered over a long period of time we may term racial immunity or racial tolerance. It is really a cumulative effect of individual infections in successive generations and is the quality in the tuberculous that activates the proliferation of fixed tissues (connective and reticular) about the focus of infection. This fibrogenesis and the hypersensitiveness called allergy are responsible for the common pathological and clinical manifestations that we find in the adult type of disease today; the former causing proliferative and the latter exudative changes. Fibrogenesis may be considered as a function of regularly repeated exposures during the past, while allergy is a function of existing infection. When allergy develops in these partially immune people, with moderate doses, there will be a rather rapid encapsulation; but when it develops in a primitive race the result is the strictly exudative type of tuberculosis, such as pneumonia and meningitis. In fact, it is easy to point out the races of people that are now or have been in the centres of the greatest commercial activity, especially when considered with the industrialization of the world. According to Drolet (17), "the present lesser and decreasing amount of tuberculosis among the Jews, the Italians and the English, all stocks that have known town and city life longer and a greater amount of infection than, for instance, the descendants of agricultural stocks, or those living formerly in the open air, like the Irish, the Scandinavians, the Negroes and the Indians, can also be better understood." The value of this work rests on the fact that all the races reported were in the same city under similar general condition. The only thing to be desired is a like comparison of subjects of the same races, in the same city, following the same line of work, and having the same home conditions. It is doubtful whether the results would be materially altered. For example, the Swedes and Italians are both chiefly engaged in construction labor and the home life of the former may even be better than that of the latter, yet the tolerance to tuberculosis is greater in the Italians. The Irish who seek out occupations as policemen, railway men, etc., have a high death rate, yet these occupations have a very low death rate among other races. The French and, according to Coni (18), the Spanish are chiefly engaged in kitchens, bakeries, offices, etc., yet their death rate is about double that of the Jews, who are also shop owners and inside workers, even though the home life of the former is probably on the average above that of the latter. The Jews who have been in the thick of civilization for three thousand years produce an example that is unique and might well be the subject for a whole discourse alone. From these data it seems that we have incontrovertible evidence of a cumulating racial immunity.

One thing further must be said about racial immunity and that is that it is lost when a race withdraws from the active channels of industry. In fact, there is no doubt that races have drifted back to the pastoral life and lost the infection and the immunity completely, only to be reinfected again when modern industrialism has come in. Persia (19), the Soudan (20), Egypt (21), Greece (22), and perhaps India are all examples of communities in which tuberculosis once thrived, but today it manifests varying grades of racial reinfection with a loss of former immunity. It must be borne in mind, however, that this cannot be used as an argument in favor of the spontaneous disappearance of tuberculosis. It would be possible if the world were large enough to allow everyone to follow a pastoral life, but the big cities are here to stay and so is industrialism and rapid communication. These facts alone insure a long sojourn with tuberculosis. As it is, these nomadic peoples simply furnish fuel to the fire when they reenter the active theatres of civilization.

We can see that potent as individual and racial immunity is, it is by no means adequate to stem the onrushing tide of tuberculosis, even barring the future increase in congestion and industrialization.

ARTIFICIAL DEFENSIVE MEASURES

A different phase of the subject is that of artificial defensive measures or those that have been brought about by the intellect of man. These factors may be summarized under the headings of social measures, public health measures, and laboratory research. They will be dealt with in order.

SOCIAL MEASURES

After the scientific investigators had pointed the way to prevention, it remained for someone to carry out these measures in practice. Societies for prevention, therefore, sprang up all over the civilized world, among which was our own National association. It is difficult to evaluate the comparative service rendered by the army of workers engaged in the social aspect of tuberculosis, but in volume of work

done, lives saved, finances raised, it unquestionably ranks first. In fact, tuberculosis has been called a social disease and not without reason, because the bulk of activities in its prevention is a social problem. The great decline in death rate has been largely due to these activities because all the early diagnoses possible would not lower the death rate materially if there were not a constant effort to stop the disease at its source.

The propaganda of education spread among the working classes by the various associations for the prevention of tuberculosis has slowly but surely been taking effect. Working conditions have been improved, the old sweat shops are gone, with airy, sunny factories in their places. Workmen are protected in hazardous occupations, working hours are shorter, living conditions have been bettered, and poverty has been reduced; thus the "soil" for tuberculosis has been removed. People have been taught the dangers of infection and the methods to prevent infection. The true nature of the disease has been taught. The patients have been followed up after recovery and have been placed in occupations suitable to their physical condition. Last of all, the various organizations have been united so that a more perfect liaison between the various organizations will result.

Notwithstanding all this, there is still room for improvement and no doubt much more progress will be made to meet the increasing production of tuberculous "soil." There is absolutely no hope, however, that this means alone will wipe out the disease. There will always be dissipation, poverty, congestion, and increasing industrialism—the soil; and, as we pointed out previously, there is no likelihood of completely destroying the seed. This is further borne out by the fact that in cities today we all receive on the average at least one infection before ten years of age. Perhaps there are many during our whole lives. These small doses help to give us a partial immunity to the disease. Assuming that the open cases and sources are wiped out so that we get but few infections, soon the disease will revert to the form found in primitive people, and continual "epidemics" of tuberculosis will result.

PUBLIC HEALTH MEASURES

Of all the measures aimed against tuberculosis there is none at present with the potentialities of the public health organizations. These organizations have an enviable record in practically wiping out bovine tuberculosis by the inspection of cattle and meat, and the pasteurization of milk. They are also in a point of vantage against human infection, although they cannot use the same measures against this type that they have used against the bovine. Such measures as the destruction of septic material, sputum, etc., the ordinances against spitting, the reporting of open cases, have been remarkably successful. The forcible hospitalization measures have met with some difficulty in enforcement. Yet, there is no better means today of lowering the death rate than a vigorous but humane application of such measures. This work is yet in its early stages and it is doubtful if it ever can be applied to its maximum efficiency. For example, there is little advantage gained on the whole in enforcing these measures in one community and not in the surrounding ones. Perhaps it might eventually work out satisfactorily, as the neighboring community would soon learn that it must follow suit to prevent its becoming a dumping ground for all the undesirable tuberculous patients.

First of all, it seems that a more persistent attempt should be made to educate people to live more hygienically, beginning in the public schools, if possible. The necessity for enforced hospitalization is not apparent to a large mass of people because they cannot understand why tuberculosis should be looked upon as such a plague now since it has been a "household pet" for so long. A thorough campaign of education, beginning in the public schools, will greatly simplify the problem.

After an adequate educational campaign the law could be made more drastic and progressively applied more vigorously. This is the attitude taken in Germany (23). Heitmann in Norway (24) and Hunziker in Switzerland (25) have drafted new laws that are extremely drastic yet comprehensive. An important feature in both laws is the compensation for the isolated patient. As Heitmann says, "It is obvious that if a person is deprived of his means of livelihood to benefit the public, it is the public's duty to see that he is not rendered destitute." Some such a plan may be made operable, because the incorrigible patient could then be deprived of his allowance if he became unruly. For just like every other group of people, there are some tuberculous patients who do not understand any language except a "law with teeth." Perhaps some such provision would render the law more operable here in America, where anything that appears to interfere with personal liberty is looked upon with great suspicion.

Probably the greatest practical service in the past has been the work of sanatoria and dispensaries where patients are treated, educated in their disease, and taught their duty to themselves and others. As Watterson (26) says, "the sanatorium should be the training camp for the war on tuberculosis." Starting with the work of Brehmer and Dettweiler in Germany in the middle of the last century and followed up by Patterson in England, Trudeau in America and a host of others, every municipality is establishing their sanatoria for tuberculosis. As to the methods of treatment little improvement can be made, but there is great need for more institutions and more education for patients in the institutions.

LABORATORY RESEARCH

While the actual work in the field is done by social and public health organizations, we must not underestimate the rôle played by the laboratory. The laboratory may be called the pacemaker for the other activities and without it there would be little advance. Not until such men as Laennec in the beginning of the nineteenth century pointed the way, was there any change in the method of handling tuberculosis. Laennec, who died of tuberculosis, firmly believed that he had contracted the disease at the postmortem table. While not understanding infection as we do today, he made most accurate descriptions of the gross pathology of tuberculosis—the cavity, the walls, the development of the tubercle—and laid a foundation for such men as Virchow, Cohnheim, Kuester, Rokitansky and others to

work out the microscopic anatomy after the middle of the century. During this period, the belief was ever increasing that the disease was infectious, but it remained for Villemin in 1866 to verify this by inoculating dogs with sputum. This paved the way for Koch's memorable discovery of the tubercle bacillus (1882). Ehrlich (1884) then showed how to stain Koch's bacillus so that it could be easily identified, giving us the acid fast stain. These three steps pointed the way for the profession to follow and revolutionized the social and public health aspects of the disease.

Following this Cornet, Flügge, Von Behring, and numerous others carried on experiments on the epidemiology of the disease. As previously cited, Von Behring also came to the support of a theory that has had an important bearing on our knowledge of the disease today, and forced us to realign our viewpoints.

The work on active immunity of tuberculosis has no doubt been the greatest stumbling block to research and more than anything else has put research in tuberculosis into disrepute by the poorly informed. Starting with Koch's old tuberculin, there have been hundreds of tuberculins, extracts, antigens, tuberculous proteins, defatted bacilli, polyvalent antigens, and similar preparations advocated. There have been others who have used or advocated living bacilli of attenuated virulence or otherwise. The most important and dependable work is that of Calmette (27) on cattle. He has undoubtedly applied to cattle in an experimental way what nature does during infection to man. That work cannot yet be applied to man; that is, to confer an immunity by repeated inoculations of accurate doses of living avirulent tubercle bacilli. There is hope in this field, and it may be worked out some time to a point of applicability and usefulness in human beings.

An important phase of artificial immunity is that produced in another animal and used in human disease. It would not be surprising to see great accomplishments along this line of work. It is especially encouraging since the Dicks have ferreted out the toxin of the streptococcus of scarlet fever, produced the antitoxin, purified, standardized both, and are actually preventing and arresting the disease. It is not unreasonable, therefore, to anticipate similar work in tuberculosis. In this field it seems that we have great hope for a therapeutic agent.

Starting with the work of Finsen on lupus vulgaris, light therapy has held an important place in tuberculosis treatment. It is quite possible that this is one reason why the primitive races have no tuberculosis because of the sterilizing and stimulating effect of the sun's rays. Amongst many others, Rollier (28) has achieved remarkable success with heliotherapy, not only in surgical tuberculosis but also in pulmonary tuberculosis, by putting his patients on a "primitive" regimen. Unquestionably there is some merit to it. LoGrasso (29) has reported excellent results from an "artificial sun's rays" also in pulmonary cases. The other lamps are only to be considered in superficial tuberculosis. There is undoubted possibilities in this field of work, but due to the difficulty of applying it and lack of heroic changes produced, it is questionable if this will be the method eventually found successful. It is true that all the rays have not yet been explored and some time a ray may be applied that will happily surprise everyone.

As with tuberculins, so with chemicals, drugs, etc., there have been hundreds of attempts with no results to date. There is no chemical or drug outside of food products that will modify the disease process *per se*. This field of work is difficult and few there are that find it or in fact hunt for it. However, there should be no delay in the attempt because should other efforts fail, *this is the field that we must fall back on for ultimate results.* And bear in mind tuberculosis is some day doomed to the lot of diphtheria, syphilis, and typhoid fever. As with these diseases, no results will be perfect, but the great sting will be removed and it is interesting to speculate how it will be removed, whether by immunological, chemical, prophylactic or sanitary measures. Already the prophylactic and sanitary measures based on facts established by laboratory research have made great inroads in the death rate of tuberculosis, but some time there must be a limit to this, and the laboratory must again come to the rescue. Furthermore a laboratory method for early diagnosis is needed and will surely be found. After all is said and done, there are great hosts of people who go to death without the least benefit from our present methods of treatment. There must be some treatment that will stop the progress of the disease when once established and shorten the convalescence. There must be something to save valuable men and women for society when they become stricken.

SUMMARY

As a résumé we may state that the natural means of defense against tuberculosis will become more potent in proportion to the frequency and extent of infections, yet, no more than it was a century ago, will it be sufficient to hold the disease in check.

By a combined effort on the part of the social organizations for the prevention of tuberculosis and public health bodies there will be a continued decrease in the death rate until its downward trend meets the upward rise of the effects of congestion and industrialization, when an equilibrium will result. To break this deadlock, some new measures originating in the laboratory must be evolved, either in the form of a method for early diagnosis, a vaccine, a serum, a chemical, or any two or more of these factors. Judging from results in other fields of work we may expect something within the next few decades that will at least remove the great sting from tuberculosis.

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Indications for Suspension Laryngoscopy

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The simplicity and ease by which a direct examination of the larynx can be made I first saw demonstrated by Professor Killian, of Berlin, while attending the International Medical Congress in London during the summer of 1913. This method had just been introduced by him.

This procedure consists in holding the head in a

Fig. 1.—Position of the instrument being introduced into the mouth.

fixed position by the use of a suspension apparatus, attached to the side of any ordinary operating table, and holding the mouth open by a combined tongue depressor and mouth gag. The patient is placed on the table in the same position as for any ordinary throat operation.

The examination can be made with a local, general or no anesthesia, depending on the indications for each individual case. I prefer ether anesthesia, unless there is some contraindication. When the examination is being made, a warm ether vapor can be used to keep the patient asleep, as is done in an ordinary tonsillectomy, using the suction apparatus to keep the throat clear of mucus.

In small children where there is so much obstruction to breathing, the examination had best be made without any anesthetic. With the instrument closed, a suitable size tongue depressor having been selected, it can be introduced far enough down over the tongue to include the epiglottis; then, by raising the arm, the gag is placed against the upper teeth, the arm is now hung over the shaft, which is attached to the side of the table, and the larynx can now be brought into view by the manipulation of just three screws, one opens the mouth, the other elevates the tongue and epiglottis, while the third changes the position of the head by changing the angle of the arm.

It sometimes happens when introducing the tongue depressor one fails to get the epiglottis as well. Should this be the case, the instrument can be withdrawn and reintroduced, or the epiglottis can be held up with a long probe. When the tongue depressor is properly placed, it does not obstruct respiration.

Recently, an instrument, known as a directoscope, has been introduced by a Vienna surgeon. This instrument is not unlike a bivalve uterine speculum. One blade rests against the esophagus and vertebral column as a fixed point. By opening the blade, the larynx can be brought into view. The objection to this instrument seems to lie in the fact that it occupies too much space in the mouth and pharynx.

When the suspension laryngoscope has been properly placed, with any ordinary head mirror and

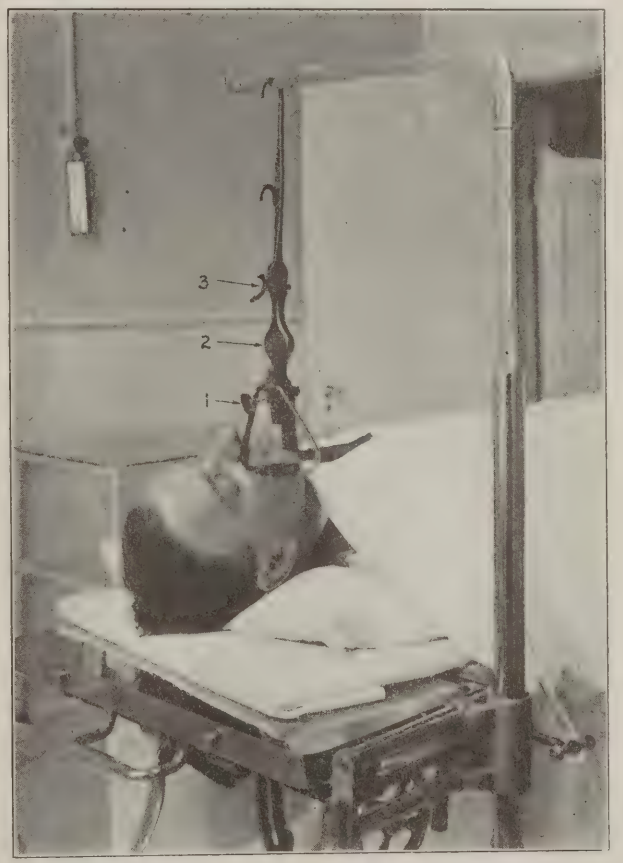

Fig. 2.—Position of the instrument in place. Screw No. 1 opens the mouth, No. 2 elevates the tongue and epiglottis, while No. 3 changes the angle of the arm, shifting the position of the head so that the larynx comes into direct view.

reflected light, the entire larynx can be inspected, treatments instituted, and operations performed by the use of straight instruments with as much ease as can operations be done upon the tonsil.

The bronchoscope can be introduced for examination, treatment and the removal of foreign bodies from the trachea and bronchi, without producing

trauma of the larynx as so often happens by other methods.

In the removal of foreign bodies from the trachea, should a first effort result in failure, the bronchoscope can be easily withdrawn and reintroduced. This method does not require trained assistants. The use of this method will prevent trauma of the larynx, which so often causes obstruction in children, necessitating a tracheotomy, or intubation.

In my hands, by this method, bronchoscopies, even on small children, can be easily performed as was formerly the case where a tracheotomy had been done.

When this method is put into more general use the removal of foreign bodies from the bronchi will be a much simpler procedure, and the necessity for a tracheotomy or intubation in these cases will correspondingly decrease.

The Clinical Interpretation of Pain

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When a disease is accompanied by pain, this one symptom is likely to surpass all others in the patient's estimation. Among the symptoms which the physician is accustomed to deal with, pain is often the most baffling and misleading, so that we are sometimes tempted to belittle it and suspect our patients are guilty of exaggeration. Imagination may be its cause, Emerson remarks, but the pain thus produced hurts just as truly as pain produced by a real disease. Pain is a phenomenon of consciousness, and it is always real. Emerson adds, even that felt in a dream. Pain and discomfort as Head states are the oldest offensive reactions of the organism and potentially painful stimuli form the basis of most primitive reflexes. Pain is an adaptive function, which is present only where it is of value to give warning of noxious influences likely to injure the body unless removed. Even the simplest animal shuns pain and moves in the direction of pleasure.

Pain forms one of the most important diagnostic aids if properly interpreted. But in so many cases it is misunderstood, the intensity of the patient's suffering crying for relief, and attention is focused on relieving the pain rather than on its diagnostic sifinificance.

Few problems are more difficult and involved than those centring about the nerves of painful sensibility. The superficial parts of the body which are more directly exposed to traumatic injury are, in general, more sensitive to pain than are the deeper parts, and painful stimuli here can be more accurately localized. In some parts like the conjunctiva of the eyeball where slight irritation may seriously interfere with function, gentle stimulation gives rise to pain and no other sensory quality may be present.

Afferent impulses from the viscera do not normally enter consciousness. Some have tried to maintain that the viscera are insensitive and incapable of generating pain impulses, but no one who has observed a patient with renal or gallstone colic can look upon that statement as anything but hair splitting dialectics. Surgeons find that the brain membranes are sensitive to mechanical injury, especially to stretching and pulling. The brain substance itself, however, is quite insensitive to pain from either mechanical or chemical stimulation.

All the power of conscious response to heat, cold, pinching, cutting with a sharp instrument or other mechanical, chemical or thermal stimuli, is certainly absent from the deeper viscera of the thorax and abdomen. As Head puts it, internal viscera are unable to respond to such artificial stimuli to which they have never been exposed during the life of the individual or race. It must be recalled that receptors respond only when the stimulus is sufficiently strong and of the proper sort—degree of intensity and kind is, therefore, the adequate stimulus. Arthur Hertz has shown that a nerve ending may be sensitive to one form of stimulus—the adequate stimulus, but insensitive to all others. As long as the internal viscera are discharging their functions normally, the afferent impulses which they may originate do not enter consciousness. This is explained by suggesting that the cerebral cortex which is responsible for the discriminating functions of sensation, exercises a dominant influence over the lower centres, represented by the thalamus whose reactions are impulsive and urgent.

It is essential to recall that the majority of the cell bodies of the afferent or sensory sympathetic neurones are located in the ganglia on the dorsal roots of the spinal nerves and in homologous ganglia of certain cranial nerves. Cell bodies of a few afferent sympathetic neurones are apparently located in the extracentrally placed sympathetic ganglia. In spite of a certain peripheral autonomy in the physiological responses of the sympathetic nervous system, the latter is in large measure regulated and controlled by the cerebrospinal nervous system, a control made possible by the intimate anatomic connections of the two systems. This synapse relation in the dorsal ganglia between afferent sympathetic and afferent somatic neurons provides the mechanism for the transfer of sympathetic sensory impulses arising from the internal viscera to the somatic sensory system and thus enter realm of consciousness. By such anatomical arrangement the sympathetic sensory impulses from the abdominal viscera would be transferred from the sympathetic sensory system to the related somatic sensory system for sensory cortical stimulation; and since the function of sympathetic nerves in general do not come into consciousness, the transferred sympathetic sensory impulses may be referred by the brain as pain to the peripheral field of distribution of the associated somatic nerves and thus brought into consciousness.

Herrick's belief that collocations similar to those occurring in the spinal ganglia between the sympathetic and somatic sensory paths are undoubtedly established within the spinal cord and brain, probably offers the solution for referred pains in those regions where the necessary peripheral anatomical mechanisms for the transfer of sympathetic afferent impulses to the somatic afferent pathways are wanting or if they exist, are unkown.

CARDIAC PAIN

The heart muscle proper is quite insensitive to pain. The studies of Ziemssen in a patient with congenital fissure of the sternum and the experience of thoracic surgery confirm the fact that mechanical and other forms of irritation of the heart do not cause pain.

In contrast to the heart muscle the pericardium when inflamed is exceedingly painful. Pain is rarely absent as one of the symptoms of pericarditis. The pain usually manifests itself as a sharp or dull pain in the region of the apex of the heart, at times the entire pericardium is sensitive. In pericarditis it is frequently possible to elicit tenderness on pressure with the stethoscope, and on increasing the pressure with the stethoscope, the rub becomes more evident. The association of an increase of tenderness on pressure and the clearness with which friction rub becomes audible is often an equally definite diagnostic point in pleurisy. When the pleura is inflamed, the pain, stabbing in character, is intensified by every respiratory movement and becomes agonizing during a long deep inspiration which follows a cough, a laugh or a sneeze. It is absent when the side is at rest and is relieved by any treatment which immobilizes the chest, such as successful strapping. The pain as in pericarditis is frequently associated with tenderness on percussion in the intercostal spaces. Over this area of tenderness the pleuritic friction rub can usually be heard. The pain and tenderness appear to be definitely due to inflammation of the parietal pleura and possibly even to that which covers the lungs. Both disappear when the serous fluid is effused, but may persist over the upper border of pleural effusion in empyema.

As a rule pain is not a marked symptom of endocarditis. The occurrence of a cardiac pain during an attack of acute articular rheumatism, means not a pure endocarditis but an involvement of the endocardium, myocardium and the sensitive pericardium; a clinical syndrome frequently designated as carditis.

Diseases of the mediastinum and of the structures present in the various mediastinal spaces may be the cause of precardial pain. Inflamed tracheobronchial lymph nodes may produce cardiac pain. In two cases of carcinoma of the esophagus recently observed, the initial symptom complained of was precardial pain.

The stomach and the large intestines, particularly the splenic flexure, are two embarrassing anatomical neighbors of the heart, either of which when abnormally distended by its contents, either liquid or gas, may be the source of precardial pain and distress.

Concerning organic disease of the heart and its vessels, there are two lesions which are frequently prone to produce precardial pain. 1. Syphilis of the aorta, and 2, angina pectoris, thrombosis and embolism of the coronary arteries, and arteriosclerosis of the coronary arteries. The latter may be associated with aortic disease. Not uncommonly regurgitation or aortic insufficiency may cause pain over the precardium, whereas insufficiency of the other heart valves rarely induces pain.

DIAPHRAGMATIC PAIN

The localization of pain arising from the diaphragmatic pleura depends on the part of the diaphragm irritated. Clinical experience and observation during operation on and about the diaphragm under local anesthesia, show that only the peripheral portions of the diaphragm receive its afferent nerve supply from the lower sixth intercostal nerves. The pain may thus be referred to the abdomen, lumbar region or lower thorax, depending upon whether the sternal, costal or lumbar portions of the diaphragm are irritated. When the central portion of the diaphragmatic pleura is irritated, pain is experienced in the neck above the clavicles or in the neighborhood of the scapula. Irritation or stimulation of the central part of the diaphragmatic peritoneum is similarly referred to cervical segments, usually, however, to segments more caudal than is the case where the diaphragmatic pleura is affected. The explanation of the cervical localization of transferred pains from the central part of the diaphragm appears to have an embryological basis. For, notwithstanding the position of the diaphragm in the adult, it is a derivative of the cervical myotomes. Like the heart when first formed, it lies far forward in the uppermost part of the cervical region, but later descends with the heart until it reaches its adult position. The afferent cervical fibres being distributed to the diaphragm by the phrenic nerve, the belief that the phrenic and other socalled pure motor nerves are composed of but one type of fibres, needs to be revised. That the phrenic nerve contains afferent fibres has been established experimentally. In addition there is present in the literature a number of clinical studies which offer confirmatory evidence that afferent fibres are present in the phrenic nerve. Blocking of the phrenic nerve has been used successfully for the relief of shoulder pain in certain pulmonary infections, to induce immobility of the diaphragm during operation for diaphragmatic hernia and for the relief of intractable hiccough.

The occurrence of acute abdominal pain in thoracic disease not uncommonly clouds the clinical picture, adding great difficulty in establishing a definite diagnosis. As noted, inflammation of the pleura, or pericardium, syphilis or aneurysm of the aorta and arteriosclerosis of the coronary arteries may give origin to pain impulses that are transferred or referred along the intercostal nerves and produce acute abdominal pain. Less commonly, this referred abdominal pain may have its origin in mediastinal inflammation, caries of the thoracic vertebra, enlargement of the tracheobronchial lymph nodes or disease of the esophagus.

The anatomical and physiological basis of this referred pain is the following: The fact is recalled that early in the embryo the abdominal and thoracic sacs were one continuous, undivided chamber, the division occurring with the descent of the diaphragm. Furthermore, the thoracic and abdominal cavities

are both lined by serosa, the parietal portion of which is excessively sensitive. In addition, the oblique horizontal course of the intercostal nerves enables each nerve to supply afferent fibres to different parts of probably three segments of the body. Thus, neighboring segments of the thorax and abdomen, both surfaces of the diaphragm, may have a common source of afferent innervation. A further factor that complicates differentiation of the thorax and abdominal lesions is the synergistic action of the diaphragm and abdominal muscles. For any inflammation of the thorax or abdomen in which the parietal pleura or parietal peritoneum is involved induces definite interference and often complete loss of the abdominal type of respiration.

ABDOMINAL PAIN

For the clinical interpretation of abdominal pain, two types of pain should be differentiated. 1. Visceral pain, frequently designated as the socalled mesenteric pain, induced by pulling or tugging of the mesentery and by lesions not involving the peritoneal coat. 2. Peritoneal pain which results from irritation or inflammation of the highly sensitive parietal peritoneum. Frequently these types of pain are combined, but when present singly, they are characteristic and distinctive.

The abdominal viscera only rarely experience purely visceral sensations at the site of the lesion, but is usually localized higher in the abdomen. The latter is due to the fact that the majority of the sympathetic afferents arising from the abdominal viscera are centralized in the celiac plexus, from which site they are referred to the corresponding somatic afferent segment. It accounts similarly for the frequency of epigastric pain in lesions of the abdomen.

The only immediate cause of true visceral pain is tension; as far as the alimentary tract is concerned, this tension is exerted on the muscular coat. Experiments on the gallbladder and other abdominal hollow viscera show that the injection of even a small quantity of fluid so as to raise the pressure will cause disturbance due to the afferent impulses generated.

Visceral pain is usually felt deep in the abdomen and does not as a rule affect the abdominal wall. Occasionally, some deep tenderness may be present at the site of the subjective pain. As examples of visceral pain, may be cited the epigastric pain present during the nondestructive stage of appendicitis, i. e., before the involvement of the peritoneal coat; it is only with the involvement of the peritoneal coat that localized pain, tenderness and rigidity over the site of the appendix appear in the clinical picture. The epigastric pain present at the beginning or onset of a strangulated hernia and the epigastric distress in biliary and hepatic lesions.

Under the heading of visceral pain may be included the various colics, intestinal, biliary, renal and ureteral. Colics are characterized by 1, sudden onset; 2, sudden cessation, and 3, tendency to recurrence. In intestinal colic, the pain is referred above the umbilicus; the colic begins gradually, reaching its maximum point rather suddenly. The pain may reach a high grade, but never requires morphine for relief. The pain subsides suddenly. There now follows a longer or shorter interval of relief. This free pain interval is an important differentiation from peritoneal pain. The periodicity of the pain is dependent upon the excessive screwlike muscular contractions of the intestines.

The anatomical structure of the part involved is a factor of considerable importance in determining the character of the pain produced. In cases of ureteral and biliary colic, the powerful contractions of the musculature, the small lumen and the nonresisting fibrous coat, intensify the pain impulse as to make it unbearable and agonizing, so that only morphine gives relief.

Peritoneal pain in contrast with visceral pain is its exact localization at the site of the lesion. The pain is continuous and burning in character. There are no free pain intervals. It is naturally often combined with visceral pain. The pain of intestinal contraction is usually cutting in character. The intensity of the pain is not always alike, depending upon the cause and possible complications.

The intense acuteness of perforation pain and pancreatitis is the result of the continuous stimulation of both sympathetic ganglia and sensitive parietal peritoneum by chemical and toxic irritants.

Thomas has called attention to a pleural perforation pain which he regards as pathognomonic of the rupture of an encapsulated empyema into the pleural cavity. During convalescence the patient feels a sudden, sharp pain in the chest following slight exertion. In a few hours he becomes critically ill, there occurs an elevation of temperature to 102° to 104° F., the pulse becomes rapid and the respirations hollow and extremely painful. The pain localizes in the lower part of the chest or in the abdomen. Distention and marked tympany extending well up over the liver may be marked. The chest findings are not striking, but indicate the presence of a small amount of fluid. There is marked leucocytosis. Prostration is extreme.

As noted, pain may be evoked by either a noxious stimulus which attains a high enough grade of intensity to overcome the inhibition of the cortex or by disease or injury interfering with the paths through which the cortex normally exercises its control. But even when no such interference exists there is reason to believe that once the path has been opened and the dominance of higher centers overcome a weaker visceral stimulus will be followed by sensation, so that long continued irritation may give rise to pain from apparently inadequate causes. Certain bodily states may produce a diminution of automatic control, so that not only will a weaker stimulus cause painful sensations, but there may be a diffusion or spread of visceral pain and tenderness beyond the areas normally involved.

It is important to appreciate this possibility as it throws light on those puzzling cases in which the extent of pain and tenderness appear disproportionate to the existing cause. As example of this, Head mentions the conditions in which the stimulus is extremely severe as in gallstone or renal colic or a referred pain becomes chronic, so that not only is the resistance of the patient worn down by the disease, but the repetition of painful impulses facilitates their passages. Menstruation, anemia and debilitating general states such as worry or emotional shock may produce similar effects.

1007 Spruce Street.

Wassermann Control by Diet in Specific Types

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I wish to report one of five cases of feeding the body in a cycle where laboratory data will show the relation of food to the body in disease. As in diabetes, the use of the heat foods by the body, principally starch, is of the most concern. It is only used as a unit of weight in the abdominal cavity, and so introduced causing visceroptosis, mostly at the third meal, and with no attention to caloric heat units. The other cases are much the same and on this same principle. Reactions are confirmed from more than one source.

As to the following diet cards, a close study of the heat factor, starch, will bring out its place in the daily cycle, the control and ability of the body to handle correctly just a certain amount, and the lack of control where too large a quantity is attempted. Where the reaction of October 16, 1923, clearly shows progress over the previous test of September 18, 1923, the large amount of heat food ingested shown by the diet slip of October 15, 1923, to November 11, 1923, gave us a return to "moderate positive" over the "doubtful" of the previous month. With the removal of the clear starch at the noon feeding and with a supporting dose of black coffee to support the abdominal load, and with hardly any change in the November and December 11th slips, we again obtain a "moderate positive" and with no progress, and bringing out clearly that we still could maintain a constant reaction. It was clearly up to the last two slips to show body tolerance and control in feeding in cycle and to bring out the principles of starch tolerance as governed by this unit of weight, alone, in the abdominal cavity. In two weeks, December 30, 1923, all heat food was removed at the noon feeding, carried through January and February, 1924, with negatives, to be called in after six months' absence to obtain another negative. No medication of any kind was used nor is being used in cases now in the process of cycling. The following data are presented in chronological order and dated, many slips at the start being written prior to the receipt of the reaction from the laboratory.

With such evidence I sincerely hope to stimulate interest in one way of feeding the body in disease and from a new angle where progress is only made in establishing body function of its own volition, a process both logical and rational, and where results are obtained without carrying an overburdened amount of laboratory evidence, as must exist in other forms of diets.

The patient, J. H. B., showed a positive Wassermann reaction on June 23, 1923.

JUNE 1, 1923

7. Black coffee at any time. Eggs if below 60° F.
12. Doughnuts or cake, water or black coffee if below 70° F. Milk to be raised to a quart if above.
6. Eggs and boiled onions, if below 60° F. with cake and black coffee, or if temp. is going to drop below 60° F. Asparagus on soft buttered toast, cake and black coffee if below 70° F. and above 60° F. Milk and crackers if above 70° F.
Add banana or graham bread only when milk and crackers are not enough and only when below 80° F. Crackers and milk and nonacid ice cream when above 80° F.
9. Milk if above 80° F. Cool bath before third meal.

Next visit June 15th.

JUNE 15, 1923.

7. Eggs, buttered toast at any meal, if between 60° F. and 50° F. always with black coffee. Black coffee always.
12. Doughnuts or cake, water and black coffee if below 70° F. Milk and crackers if above.
6. Asparagus on soft buttered toast, cake, water and black coffee if below 70° F. and above 60° F. Milk, banana, new potatoes and crackers if above 70° F. Milk and crackers and butter beans if above 80° F.
9. Milk and crackers if above 80° F. or nonacid ice cream.

Specific gravity 1004. Cool sponge or bath before third meal if above 70° F.

Next visit June 29th.

JULY 2, 1923.

7. Native fruit if below 70° F. and above 60° F. Black coffee.
12. Doughnuts or cake if below 70° F. Water and black coffee. Milk if above 70° F. and crackers. Eggs and buttered toast and boiled onions, cake, water and black coffee if below 60° F. Mackerel, tomato sauce, new peas, cake, water and black coffee if above 60° F. and below 70° F.
6. Milk, new potatoes, banana, crackers, if above 70° F. and below 80° F. Milk and crackers. Ice cream if above 80° F. Add new butter beans if above 80° F.
9. Milk if above 80° F.

Specific gravity 1006. Cool bath or sponge before breakfast if above 70° F.

Next visit July 16th.

JULY 23, 1923.

7. Eggs, buttered toast, if below 60° F. Water, black coffee.
12. Doughnuts or cake, water, black coffee if below 70° F. Milk and crackers if above.
6. Eggs and boiled onions, bread and butter, any kind of meat, all vegetables, milk below 70° F. Milk, potatoes, banana and bread if above 70° F. and below 80° F. Milk and beans and corn above 80° F. Ice cream.
9. Milk, if above 90° F.

Cool sponge before breakfast if above 70° F. or when hot during day.

Next visit August 13th.

AUGUST 14, 1923.

7. Eggs and buttered toast if below 60° F. and only if hungry. Water, black coffee.
12. Doughnuts or cake and water and black coffee if bowels do not move well at a. m. Milk and bread above 70° F. or milk and meat, etc., below 70° F.
6. Meat and milk and all vegetables if below 70° F. Milk and potatoes or banana or bread if above 70° F. and below 80° F. Milk and beans if above 80° F.

Cold sponge or bath if hot and only above 70° F.

Next visit September 11th.

On September 18, 1923, the Wassermann reaction was moderately positive.

SEPTEMBER 16, 1923.

7. Breakfast. Eggs and buttered toast. Water if below 60° F. Black coffee.
12. Milk and bread or milk and pie or milk and crackers if bowels move at a. m. Cake and coffee if not.
6. Milk and vegetables if below 70° F. Eggs added if above 50° F. and below 60° F. Milk and potatoes or milk and bread if above 70° F.

Soapy towel for cleaning. Cool sponge when hot and above 70° F. Next test October 15th. Next visit October 17th.

October 15, 1923.

The blood showed a doubtful Wassermann.

6:30 Breakfast. Oatmeal with milk and sugar if below 50° F. Eggs and buttered toast if above 50° F. and below 60° F. Black coffee always.

12. Bread and butter and one glass of milk if bowels move after breakfast. Cake and black coffee if they do not.

6. Bread and milk on any temp. Beans or chicken or frankforts if below 50° F. and above 40° F. Have lamb or corned beef dinner if below 40° F.

Specific gravity 1010. Quick lukewarm bath Friday or Saturday. Next visit November 14th. Next test November 11th.

On November 13, 1923, the blood showed a moderately positive Wassermann reaction.

November 14, 1923.

7. Oatmeal with milk and sugar if below 50° F. Black coffee.

12. Cake or doughnuts and black coffee.

6. Milk and bread on any temp. Beans, only when voiding gas and bowels have moved at a. m. and only when below 50° F. Chicken or frankforts only when tired of beans and on same conditions and only when below 50° F. and above 40° F. Add ham, lamb or boiled dinner to bread and milk on same conditions as to voiding gas and bowel motion and only below 40° F.

Specific gravity 1012. Lukewarm bath Friday or Saturday. Next visit December 12th. Next test December 10th.

On December 11, 1923, the blood showed a moderately positive Wassermann reaction.

December 13, 1923.

7. Oatmeal with milk and sugar if below 50° F. Water. Black coffee.

12. Cake or doughnuts, water, black coffee.

6. Milk and bread every night (milk to a quart) on any temp. Beans only when bowels have moved at a. m. and only when below 50° F. Chicken or frankforts, added to beans or alone, when tired of beans, but with milk and only when below 50° F. and above 40° F. Add ham, lamb or corned beef to beans or alone with milk on same conditions, but below 40° F.

Specific gravity 1008. Soapy towel for cleaning, no bath. Some water at 10, 2 and 8 p. m. Next visit December 30th.

December 30, 1923.

7:30. Breakfast. Grape fruit with sugar. Oatmeal with milk and sugar if below 50° F. Water, black coffee.

12. Black coffee.

6. Milk and bread or milk and bread and butter every night on any temp. (Milk to a quart.) Chicken or frankforts added to milk only if bowels move at a. m. and only if above 40° F. Ham or lamb on same conditions and only if above 30° F. and below 40° F.

Beef and turnip on same conditions and only if below 30° F.

Specific gravity 1012 a. m. specimen. Soapy towel for cleaning, no bath. Some water at 10, 2 and 8 p. m.

Next test January 18th. Next visit January 16th.

A negative Wassermann reaction was obtained on January 15, 1924, and February 12, 1924.

January 16, 1924.

7:30. Grape fruit, oatmeal with milk and sugar if below 50° F. Water, black coffee.

12. Black coffee.

6. Milk and bread or milk and bread and butter every night on any temp. (Milk to a quart.) Chicken or frankforts if bowels have moved and if above 40° F. Ham, lamb or corned beef on same conditions and if above 30° F. and below 40° F. Beef and turnip on same conditions and only if below 30° F. Raisins for dessert.

Specific gravity 1010. Soapy towel for cleaning, no bath. Some water at 10, 2 and 8 p. m.

Next visit February 13th. Next test February 11th.

February 14, 1924.

8. Breakfast. Grape fruit, oatmeal with milk and sugar if below 50° F. Water, black coffee.

12. Black coffee.

6. Milk to a quart and graham bread and butter on any temperature every night if bowels move at a. m. Beef if below 30° F. Other meats if above 30° F. Fried potatoes if below 40° F. if bowels have moved at a. m. Prunes or bread pudding for dessert. Black coffee if bowels have not moved in the morning.

Soapy towel for cleaning, no bath. Water at 10 a. m. and 2 and 8 p. m.

Next visit March 13th.

The Wassermann test made on September 5, 1924, was negative.

Rural School Medical Inspection

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Since August 1, 1913, when the State Medical Inspection law took effect providing for medical inspection of all children in public schools, outside of first class cities, there has been tremendous progress along this particular line of preventive medicine, especially in larger villages and cities. In rural districts, including villages of three thousand population or less, together with the surrounding territory, including school districts of six to twenty pupils, there is still present an appalling lack of proper organization of the work, and lack of efficient followup system. Yet here is to be found a great need for the exact education proposed by the state medical inspection law.

Few today question the importance of the school medical educational system, and its great opportunity for the physical and mental betterment of school children. The children of preschool and school age are the potential forces of our country today. And any system which tends to remove and correct any one or several of their physical or mental handicaps, or tends to establish and maintain a suitable environment for their full development, is of vast importance to the community, socially, financially, and economically. Robust, healthy children free from disease so far as humanly possible, with wholesome ideals built upon a groundwork of healthful habits developed in their early years, should be the goal of all school health work. The thing to be desired is not only the maximum health during school life, but its fruition in young men and women, who will have sound bodies, sound minds and a happy outlook upon life, which will enable them to contribute most to the future of the nation.

The essential to an effective plan for such health work in rural schools is proper organization, with leadership invested in the hands of a duly licensed physician, capable of making proper physical exam-

inations and mindful of the importance of slight defects, ever alert for minor deviations from the accepted normal, and familiar with hygiene and sanitation. There should be but one such medical inspector for a given section, appointed for a term of years, which will enable him to establish a system and remain in power to carry it to completion. It is the custom of some communities to appoint a medical school inspector, who is such in name only, and appointed solely for "getting by the law," the examinations being done by the family physician or whoever the child himself selects, the physician not seeing the child again for examination for several years if at all. Under such a system there can be no possible uniformity of results, or any standardization of methods. The result is that the child is examined from year to year by first one physician, then another, each stressing different points, reporting and rereporting defects, suggesting a wide variation of treatment, and succeeding only in collecting their fees, and greatly confusing the parents, and establishing an unfriendly feeling toward school medical inspection. Proper leadership and inspiration on the part of the community, together with an enthusiastic force of teachers with health ideals, and an appreciation of health measures, linked with an efficient followup system, would entirely do away with all this, and produce results entirely gratifying and well worth the money spent.

More than half of the school children of the United States are attending rural schools. And these children are on an average less healthy, and are handicapped more by defects, than are the children in the city. It is a mistaken idea that children reared in the open country, with its abundance of fresh air and sunshine, are healthier than their city neighbors. To be sure they should be, but, as a matter of fact country people have neither the knowledge nor the inclination to adapt these advantages to the healthful development of their children. By a comparison of available statistics on the prevailing defects among children in city and country it is found that teeth defects are fifteen per cent. more common in country children than in city children; diseased tonsils twenty-eight per cent. as compared with sixteen per cent. in city children; twenty-three per cent. of country children have adenoids against twelve per cent. in city children; eye defects are eight per cent. more common in the country; and sixteen per cent. of country children are malnourished as compared with seven per cent. of city children. It is evident, therefore, that the most vital phase of rural health relates to the health and welfare of the children.

The reason for the prevalence of such conditions is to be found, first, in the fact that the general impression among farmers is that if they live and conduct themselves as did their fathers and grandfathers before them they will be equally successful. As far as disease and health conditions are concerned, it is only a matter of heredity and environment. The existing conditions of the farm were good enough for their ancestors, and will also serve them. They had such and such diseases and so their children will probably have them also in spite of anything that is done. This conception is based on pure ignorance of the fundamental laws of health and disease, and a great lack of health interest and education.

Secondly, economic conditions are at the present time such as not to permit of the proper expenditure of time and money on preventive health measures. The farmer's time is entirely taken up with the problem of making a living for his family and maintaining his business interests. The demand from this source at times becomes so urgent that the older members of the family—both boys and girls—have to be pressed into long hours of service, sacrificing, consequently, health and education for the bare necessities of life.

It is not unusual to find boys of twelve and fourteen years of age getting up at three and four o'clock in the morning, the year round, going out and taking a man's place in doing the chores, coming in and eating a hasty unbalanced breakfast, and hurrying away to school, with only a cold lunch. Returning from school, they find more work waiting which requires several hours of their energy, getting to bed seldom before nine or ten o'clock with barely six hours to sleep when the same routine is to be repeated. There is always work on the farm and under presentday conditions of low prices, small crops, and shortage of dependable labor which can be had at a reasonable price, there is a tendency many times to keep the children at home to work and send an excuse to school for sickness. If this practice is not permitted, at the attainment of the age of sixteen years a working certificate is obtained. Thus the rural child is entirely cut off from his education and forced to live under conditions which prematurely age him and undermine his health.

Assuming there is proper education along health lines and time on the part of the individuals to permit them to carry out their instructions, there still remains a third factor which contributes very largely to existing rural health conditions. This is denial of proper medical attention, distance from clinics and dispensaries, absence of community health centres, and lack of proper school nursing facilities. This is a larger factor than at first supposed Many communities are entirely without medical services. Families have to depend on the services of a physician miles distant. Consequently minor conditions do not receive the proper care. Contagious diseases are not reported and quarantined. Small discomforts are allowed to pass. If the condition persists, a doctor is called in only as a last resort, and often only after serious complications have developed, which in many instances will permanently impair the individual, but are entirely avoidable if taken in time. Facilities are not at hand in the country for the proper examination, observation and study of health problems. The need for clinics is greatest in the field of prenatal medicine.

From a study of one school supervisory district situated in a western New York county, comprising five towns with a total of fifty-six districts, with a registration during 1923-24 of 1,886 pupils, it becomes very evident that rural health is being neglected, and that it offers great possibilities. These rural districts have an individual registration of from eight to six hundred and twenty-six pupils, with an average of 76.5 per cent. examined. Out of this number there were 1,385 defects reported, averaging about one defect to each pupil. Of this number of defects 1,297 were recommended for treatment and

only 27.5 per cent. of the recommendations or 25.7 per cent. of the defects were actually treated.

Teeth defects were the most prevalent. Tonsils and adenoids, and eyes followed next in importance. In nearly every instance all teeth defects were recommended for treatment, and it comprised also the largest percentage of treatments. It is to be remembered, however, that cases treated included all children who had their teeth cleaned, while defects included only actual cavities, deformities and diseased gums. Few cases of tonsils and adenoids were recommended for treatment. Of those recommended thirty-three per cent. were treated. The laity is coming to recognize the importance of diseased tonsils and adenoids, faster than are many rural physicians. The tendency is to dismiss the subject with the old and much abused saying: "They will outgrow them." Unless a tonsil exudes pus or is ragged and necrotic, it is seldom recommended for treatment. Mouth breathing, listlessness, physical and mental deficiency, loss of appetite and in many cases even facial deformity itself seldom suggest adenoids to the average rural physician examining in rural schools.

The eye shows a satisfactory percentage of treatment. Yet the type of treatment deserves some comment. The average defect is slight eyestrain; with vision 20/30 seldom less, occasional headache, and an effort on the part of the pupil to read. Burning and itching of the eyes, and blurring of vision are present in twenty to thirty per cent. of the children with defective eyes. When treatment is recommended for this type, the parents consider their duty complete when they have taken their children to an "eye doctor," who "fits them with glasses," which do not show the slightest degree of correction for myopia or astigmatism. In fact the probability of the existence of either of these defects did not enter the mind of the "eye doctor," his concern being simply to supply a pair of glasses.

In one school of over six hundred pupils ten per cent. of the girls showed evidence of goitre and only four per cent. were recommended for treatment and not a single one treated.

There is still another side to this study which in a measure may account for its very poor showing. Fourteen part time medical inspectors did the work, at a fee from seventy-five cents to one dollar a pupil. The actual time devoted to the work averaged eight minutes an examination, one school being done in the record time of six pupils in five minutes. The examinations constituted the inspector's entire part in the school health program. In those instances where notification cards were sent to the parents, it was taken care of by the teacher. No nurses were employed for followup work. Qualification of medical inspectors were not considered. Osteopaths did some examinations. Under this system $1,264 was spent for school inspection services; and on the basis of actual number treated only $303 value was received, the average yearly loss per capita being fifty cents.

It is no wonder that under such a system of school medical inspection that country children are less healthy and present more physical defects than those living in the city under a properly organized system. The results are not alone reflected in mental and physical health. The average group of farm children leave school before fifteen years of age, only twenty-six per cent. remaining in school until their sixteenth or seventeenth year. The grade completed is 7.7. Only forty-two per cent. completing the eighth grade. The rate of progress a grade a year is only 82.8 per cent.

Also it is notable and interesting that in this same group of children the great majority of those who are well along in school and accomplishing the best results, are the children who are physically fit and up to the average weight for their height. Children who are retarded in school grades are uniformly shorter and lighter for their years as well as underweight for height, while those who are in the proper grades for their age are the ones within the safety weight zone. From a study last year of 41,151 boys in Detroit, Michigan, there was found to be a close relation between underweight and backwardness in school, and between average and optimum weight and advance in school. Those from .7 per cent. to 8.5 per cent. underweight were retarded from one half year to four years in school. Those from 1.4 per cent. to 10.2 per cent. above average for height were accelerated from one half year to two and one half years in school.

It seems reasonable, therefore, to believe that if the great handicaps, defective teeth, diseased tonsils and adenoids, eye strain, and malnourishment were removed in the school child and prevented in the preschool child this average could be increased and consequently increase the efficiency of a very large group of our boys and girls.

RECOMMENDATIONS

The rural school medical situation at present is demanding attention, and with its natural facilities at hand it should be on a par with health conditions elsewhere. As a means toward this end, the following recommendations are suggested:

1. Less elastic State educational laws requiring the appointment of a school medical inspector and graduate nurse at a definitely stated salary, sufficient to carry responsibility with the position, whose duty would be to supervise a given area, determine the existing defects, direct correction and prevention.

2. State aid in the establishment of health centres or clinics, which can serve as a source of information and instruction, and to be used in conducting prenatal and preschool child work. Here also meetings could be held occasionally at which time vaccination, diphtheria prevention, etc., could be discussed. The health films of the State Health Department could be used to great advantage in this connection. These centres to be under the control of the school medical inspector and nurse.

3. Extensive encouragement of young physicians to locate in rural communities. This situation is becoming alarming. The general tendency is for graduates in medicine to stay in the city and specialize, to the extent that the general practitioner is gradually becoming extinct. At present they are relatively old men, and if this swing toward the city and specialization is not checked, a young man cannot be found in the country, and soon large areas will be entirely without a doctor. As a matter of fact it is not uncommon to find villages of from four to eight hundred population, with a large surrounding territory without a physician which only a few years ago amply supported one. Such conditions greatly hin-

der rapid progress toward organization of definite health programs.

Rural schools present many and varied medical problems. These must be met with a definitely organized system of inspection, education, and followup work, including health centres and clinics. Under the system at present working in many rural districts, the mental and physical health of nearly fifty per cent. of our school children is being neglected, besides being operated at a great financial loss each year to the district.

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Artificial Pneumarthrosis as an Aid in Diagnosis

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The usual clinical picture of a loose and injured semilunar cartilage is so definite that there is not much difficulty about its diagnosis. However, now and again, we encounter cases in which there is recurring or persistent effusion into the knee joint and disability, but there is no positive history of an injury or locking and the tenderness is not localized over the semilunar cartilages. In such instances, which are not at all infrequent, additional means of ascertaining the exact nature of the pathological change are desirable. Some time ago (1) I called attention to the value of injecting oxygen into joints before having them x rayed for purposes of diagnosis. I reported several cases in which this procedure helped to arrive at a positive diagnosis and indicated the proper treatment. In particular I gave an account of the case of a woman who, following an injury, had persistent pain and swelling of one knee. There had never been any locking. She walked with a limp and there was tenderness at the joint line, sometimes on the inner and sometimes on the outer side. The motions in the knee were painful, but only slightly restricted. There was evidently an internal derangement of the knee joint due probably, but not positively, to an injury of the semilunar cartilages. The usual x ray pictures were negative. The joint was injected with oxygen and another series of pictures taken. In the anteroposterior view two transverse linear shadows were visible, one above the external tuberosity and the other above the internal tuberosity of the tibia. These shadows presumably represented loosened and elevated semilunar cartilages, which would account for the symptoms. As the patient refused operation, I did not have the opportunity of verifying my diagnosis. Sir Robert Jones and Dr. Royal Whitman, to both of whom I described the case and showed the picture, agreed that the interpretation of the linear shadows was probably correct.

Recently a patient came under my care in whom I was able to confirm the diagnosis of loose internal semilunar cartilage made on the basis of a linear shadow above the internal tibial tuberosity shown in an anteroposterior radiogram of the knee after the joint had been inflated with oxygen.

Case.—Mrs. C. K., twenty-nine years old, applied for treatment at the New York Hospital for Ruptured and Crippled, October 13, 1922. She complained of discomfort and of something slipping in both knees; the right troubled her more than the left. She had had difficulty with the right knee for two years, but the left one became uncomfortable only three months previously. Dr. Whitman made a diagnosis of laxity of the right internal semilunar cartilage. He operated on the right knee on October 16, 1922, and removed the internal cartilage which he found to be entirely loose.

The patient consulted me on March 3, 1923, complaining of pain, swelling and stiffness in the left knee. She stated that her knee "locked" at times. From her description of locking, I doubted whether she appreciated what locking of a joint meant. She had never had any injury of the knee. The joint was enlarged and there evidently was a synovial effusion. There was tenderness on the inner side of the knee, but this was not definitely localized. While there was no doubt that there was an internal derangement of the knee necessitating an operation, and it was likely that the derangement was due to a loose semilunar cartilage, yet the diagnosis was not beyond question, as there are various conditions of the knee which might have given a similar clinical picture.

On March 6, 1923, after the usual surgical preparation, the left knee was distended with oxygen and x ray pictures were taken. The anteroposterior view showed a linear transverse shadow above the internal tuberosity of the tibia extending from the tibial spine somewhat more than half way across to the internal border of the articular surface of the tibia. There was a distinct interval between this shadow and that of the tibial tuberosity. There was no other discernible lesion. This shadow was interpreted as that of the internal semilunar cartilage which, being loose, had been lifted up from the tibia by the oxygen forced into the knee. A positive diagnosis of a loose and displaced internal cartilage was made and its removal advised. The patient was operated upon by me on June 1, 1923. The usual short vertical incision was made about an inch to the inner side of the patellar ligament. When the capsule of the knee was reached and before it was incised, the semilunar cartilage was palpable and found to be elevated from the tibia for at least a quarter of an inch. The capsule was incised and the anterior part or body of the cartilage was seen to be detached from its usual position. The cornua of the cartilage were in contact with the tibia. The cartilage was removed completely and the patient made an uneventful recovery, regaining complete and painless motion in the knee.

In an interesting paper on semilunar cartilage derangements read before the American Orthopedic Association in June, 1923, Dr. H. P. Mauck reported some experiments on injuries of the knees

in cadavers. By previously staining the cartilages he was able to show them in the radiograms. The case here reported is the first one in which I was able to demonstrate positively by radiogram before operation that the internal semilunar cartilage was loose and displaced from its attachment to the tibia.

The experience in this case is additional proof of

Fig. 1.—Mrs. C. K., anteroposterior radiogram of left knee. Note transverse linear shadow above the internal tuberosity of the tibia, indicating loose and elevated internal semilunar cartilage.

the value of the injection of oxygen into joints before x ray pictures are taken. By this method we are able to obtain shadows of the soft structures in the joints and can study their size, position and consistency. Thus we may obtain information that is helpful in the interpretation and understanding of the clinical phenomena. In a recent case I was able to prove by this procedure that the joint space in a tuberculous knee was completely obliterated by tuberculous tissue. This was important information because there was some motion in the knee and the patient's parents were especially anxious to obtain a cure with some function. With that in mind they denied their daughter the advantages of a timely excision of the joint. After the usual oxygen injection, I found the gas in the subcutaneous and periarticular tissues and none between the tibia, femur and patella. Having proved in this way that there was no joint space left, the parents were convinced and consented to the necessary operation. The correctness of the interpretation of the radiograms was then confirmed.

In the last few years the use of gas for distention of body cavities has been greatly extended and many interesting and valuable observations have been made. Stein and Stewart and latterly Rubin have done exceptionally good work and given us literally an insight into the abdominal cavity, which has at times revealed remarkably clearly, pathological conditions, which previously could be seen only in the operating room or on the postmortem table. Oxygen, nitrogen and other gases have been used and various more or less complicated apparatus devised. In the inflation of joints oxygen has served very well.

An ordinary oxygen tank is used; preferably one from which most of the gas has been removed so that the pressure is reduced and can be more easily regulated. A rubber tube two yards long with a lumen of a quarter of an inch and a stout needle about an inch and a half long complete all the equipment that is necessary. The needle and tube are sterilized. One end of the tube is attached to the tank and the needle is inserted into the other end. Some gas is allowed to pass through the tube and needle to clear the track of any fluid which may be there, and also to enable the operator to judge the degree of pressure in the tank. After painting the knee with iodine, the needle is placed on the outer side of the front of the knee just below and external to the patella. It is plunged into the knee in an upward, inward and slightly backward direction so that the point of the needle reaches somewhere behind the patella. The insertion of the needle can be executed so rapidly that in all but extremely neurotic individuals no local anesthetic is necessary. When the needle is in the joint it should be held firmly, otherwise the point of the needle will scratch the synovial membrane and cause discomfort. The gas is then allowed to flow in slowly; rapid distention of the joint is extremely painful. Under ordinary circumstances a joint may be distended sufficiently in about one to three minutes. The needle is withdrawn rapidly, a sterile dressing applied and the limb is ready to be x rayed. I have found no need for measuring the volume of gas injected. Enough oxygen is allowed to flow in to distend the joint so that there is a moderate swelling. Unless the joint is obliterated or the point of the needle is not in the joint cavity, there is little resistance to the flow of the gas.

Usually there is moderate discomfort, but rarely sharp pain, during the injection. This stops immediately or very soon after the needle is withdrawn. I have not yet had occasion to aspirate the oxygen because of severe or intolerable pain. The oxygen is gradually absorbed and disappears entirely in eighteen to seventy-two hours. Occasionally there is crackling in the skin for several days, but I have not seen any ill effects from the inflation of either joints or bursæ. Thus far I have made it a practice to keep the patient in bed for a few days, especially if the joints of the lower limbs were injected. This may be an unnecessary precaution but I have noticed that the patient himself is unwilling to move about much for a number of hours after the injection.

The inflation of joints and bursæ with oxygen has in many cases proved to be valuable. The shadows of pathological soft issue and of loose bodies are intensified because they are surrounded by the lighter areas of the gas, and hence are readily differentiated from the shadows of adjacent bones. I have by this method been able to demonstrate pedunculated and loose bodies, hypertrophied syno-

vial tissue, adhesion of bursal walls, obliteration of joint cavities, the size and extent of joint cavities and in the case here reported a loose internal semilunar cartilage, all of which conditions were not evident in the ordinary radiograms. The distention of joints with oxygen or artificial pneumarthrosis is a simple, harmless but important diagnostic aid which should be used extensively in the radiographic study of joints.

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Common Duct Complications After Gallbladder Surgery*

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My series of gallbladder operations are limited to a little over one hundred cases, and while I have learned something, they are not sufficient to interest you as much by themselves as they would if coupled with the experience of other surgeons and the literature of today.

Complications which follow gallbladder surgery may sometimes be caused by the operation itself and at other times they are not complications *per se* but the result of a preexisting pathological condition which was not removed by the operation.

The common bile duct and hepatic ducts are lined with tall epithelium in a single layer on a submucosa of firm elastic fibres that run longitudinally, and this is the main support of the tube that is capable of great distention. The epithelium undergoes quick repair and stretching of the elastic tissue is soon overcome unless there is a tear or cut in its continuity, with the production of fibrous tissue and stricture formation. Outside of the elastic tissue there is a muscular layer and a fibrous covering. In the duct wall are glands.

Judd calls postoperative lesions those that occur six months after operation, in order to be sure that in his series of cases they did follow operation, as those that exist before generally manifest themselves before that time.

Strictures along the duct, stones in the ducts, stricture at entrance into gut, adhesions, enlarged glands and tumor or malignancy of the head of the pancreas may all be preoperative, and while not the result of operation, should be looked for and not allowed to escape notice at operation. Cholecystitis and hepatitis may also be present before operation and may or may not be amenable to operation by draining, according to their cause, the length of time they existed and the extent of the damage already done. Damage to the common duct may be the direct result of the operation, such as traction on the cystic duct and tearing or breaking the common duct, partial or total cutting of duct, either longitudinally or crosswise, cutting cystic duct too flush or into common duct; traction of cut end of cystic duct may cause angulation.

All these may cause slight or great obstruction to the common duct sooner or later, from the resultant stricture. The cystic duct should be as accurately as possible identified and picked up clean, as blind grasping with forceps for the cystic artery may catch the common duct.

All gallbladders should be observed before resection is started and if the cystic duct can be identified, removal should be started from that end. If structures are covered with adhesions and separation is difficult, it is better to drain than to endanger the patient's life and risk future complications by persisting in trying to do a cholecystectomy.

I am not an advocate of removing the gallbladder by tackling a certain end always first, for in some instances they come out easier one way, and in other instances another way. When distended with stones or fluid it is sometimes safer to do a cholecystectomy after emptying the gallbladder. Before cutting the cystic duct and artery always fasten the ligature through the tissues around them, so that it cannot possibly slip. Do not trust the forceps to hold the ligature until you can tie it later, as all forceps will not hold and even if they do, it is not impossible accidentally to remove the wrong forceps or knock them off. Catching at a cystic stump is difficult to say the least, and if it falls against the common duct, may be caught with it.

After the cystic stump is securely tied, it should be allowed to take its own position and not be drawn tight by a continuous suture that closes all the raw area. Deaver says: "The nearer the patient is to being well when operated on, the surer he is of getting well." He further says: "The surgeon is never called too early but he may be called too late." He and all good surgeons recognize that there are cases of jaundice that do not need operation but what he means is that the longer operative cases stand before operation the less chance there is of complete and absolute recovery from the resultant damage done.

There are cases where cholecystectomy or cholecystotomy is done, when we have to take a chance as to the pathology that is left, but in all cases where possible, the common duct, the hepatic duct, the ampulla of Vater and the head of the pancreas should always be examined so that stones, strictures, tumor, enlarged glands and adhesions will be corrected. Adhesions of the gallbladder to the viscera should always be separated as fistula may be present.

The stump of the cystic duct may undergo dilatation, but it matters little if it does and should never be cut flush, as it may do more harm than good. Enough cystic duct to insure the integrity of the common duct is, in the opinion of the Mayos, the safest procedure and will rarely give rise to trouble.

Incisions in the common duct, whether for stone

*Read before the Norfolk County Medical Society, February 9, 1925.

or drainage, rarely cause trouble. The incision in the long axis of the tube is usually more useful, but the transverse incision is said to be no more prone to cause stricture. Infection of the gland within the wall of the duct is thought sometimes to cause stricture.

It is important at this point properly to interpret the history of the patient—pain, sharp and cutting, preceding jaundice. Painful jaundice is more amenable to permanent relief by operation than painless. Most operative pain from the obstructive type requires anodynes for relief. Pain and discomfort from gas accumulation, due to hepatic or bile insufficiency, are not so severe. Jaundice with or without leucocytosis has its significance. Chronic painless jaundice is a dangerous operative type and often malignant in either pancreas, ducts or liver.

We know that two mg. of bilirubin in one hundred c. c. blood is the normal amount and above that amount it becomes farther and farther away from normal. Blood chemistry goes farther and indicates whether bile in the blood is the obstructive or the hemolytic type. Sclerotic icterus and bile in urine rarely appear unless the blood content is above two mg. to one hundred c. c. Deaver wonders whether the quality of the bile in the tissue is not as important as the quantity and what future investigations may assign to quality.

Mayo says that biliary cirrhosis is most often the result of infections and obstructive processes having their origin in the gallbladder or common duct, usually from gallstones.

Personally, I believe that all gallbladders that are distended at all, that do not empty readily and easily, and that have a history of nausea and gas accumulation, should all be taken out in abdominal operations, where no more than trivial additional dangers are incurred. The gallbladder as a rule is not as sudden an enemy as the appendix, but in the long run it claims more victims than its rival and the day may come when we shall not say that an innocent gallbladder has been removed, as is not said of an appendix.

In the biliary cirrhotic type where the liver is enlarged, dark in color, bleeds easily and is soft, the infection must be eradicated by the removal of all stones whether in the ducts or the bladder; removal of the infected gallbladders and in addition drainage of the common duct by the T-tube of Kehr or catheter as used by Robson.

In chronic types where the liver is enlarged, lighter in color and hard and the ducts are thickened and the spleen enlarged, removal of the spleen and prolonged drainage are indicated. Some light may be obtained from the fact that paroxysms of acute pain due to stone obstruction can only be relieved medically by morphine, while pain due to muscular contraction, though intense, is easily relieved by intravenous injections of atropine alone, which is said to produce no bad effects except flushing of the face and dryness of the throat.

Jaundice and sudden clay colored stools accompanied by colicky pains which are not relieved by atropine alone but require morphine also, indicate stone within the bile ducts. Catarrhal jaundice in young persons free from clay colored stools, not painful and not obstructive, is not operative.

A kink in the cystic duct may cause great distention and discomfort, as will often obstructions of the cystic duct from stone and inflammation, and requires only the removal of the gallbladder and duct beyond the point of obstruction.

In jaundice of cholangitis, not due to stone obstruction of the common duct, but to choledochitis with thickened duct walls and normal gallbladder, anastomosis of the gallbladder to the second portion of the duodenum is indicated. If the common duct is obstructed by stricture this operation may suffice, but dilatation of the stricture with T tube drainage is perhaps better. Whether fresh or old, where the tube is severed it should be joined end to end and drainage inserted, but if the distal end is destroyed and cannot be dug out, a tube from the proximal end into the bowel will sometimes establish a canal from the continuous flow of bile.

Where possible, the hepatic or common duct should be linked with the bowel and no attempt made to form a duct from tissues, as it does not act well. Even where everything is covered with adhesions and the foramen of Winslow is occluded, do a painstaking dissection and get the best exposure possible, for again in the words of Deaver, "to operate blindly is to operate unsuccessfully." And again, Deaver says, "Faith in negative x ray findings and medical drainage are in part responsible for delayed operation and to no less degree for failure to make an early diagnosis."

Chloride of calcium intravenously may be of value in preventing hepatic insufficiency and postoperative bleeding. Bilirubin may rise from the normal two mg. in one hundred c. c. blood to eight mg. in one hundred c. c. blood without visible jaundice after obstruction to the flow of bile. Visible icterus in the skin, urine or scleræ depends more on the duration than the amount. Blood chemistry then is quicker to detect jaundice than is visible icterus.

The usual site of the stricture in the common duct is at the junction of the cystic duct, as the most common site of injury is the least dilatable portion of the duct and the most frequent location of inflammation. A fistulous opening leads to stricture, as the end of least resistance generally stays open.

The youngest patient I have operated upon was thirteen years old and the oldest ninety-two years old. I have had four deaths which is less than four per cent. This is partly luck and partly due to the fact that in many cases the gallbladders were removed at other operations where disease did not extend beyond the gallbladder.

Two of my patients were operated upon the second time by me, one a month after the first operation for continued purulent discharge, when a piece of gauze was removed, followed by rapid recovery.

Another patient who was greatly jaundiced was operated upon by me three years after cholecystectomy. In this case three glands the size of the end of the thumb were removed from around duct. These glands were causing pressure, and drainage was put in, with recovery after long drain.

Another patient complained of intermittent colicky pains without jaundice, but refused another operation. The patient later died from a fall and at postmortem a stone was found at the papilla of Vater. This stone had been overlooked at operation.

The Combined Right Inguinal Hernia and Appendix Operation

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In the past few years, frequent clinical reports of cases of acute appendicitis encountered in inguinal hernias have appeared in literature. Wildman (1) reports such a case that came under his observation and reviews the literature citing very many more. Another class of cases that are not reported are those of appendicitis in patients who have previously undergone right inguinal hernia operations. Many such cases have come under my observation, as they have to almost all surgeons, and a review of these would be superfluous.

In an article over a year ago (2), I demonstrated the simplicity of doing the combined operation where the inguinal hernia was on the right side. In that article the anatomical relationship between the appendix and the right internal ring was demonstrated. With this operation as a routine, many of these subsequent appendectomies would have been avoided. There are other and more potent reasons for doing the combined operation. In the majority of the appendices so removed, distinct gross pathological changes were found. Only a small proportion are macroscopically normal. The majority are of the chronic adhesive type and not a few are subacute or even acute.

In children the cecum is freely movable and may at times be found anywhere in the abdomen; consequently the appendix in these patients has a greater range of mobility than in adults. Only in adolescence does the cecum become fixed to the posterior abdominal wall. In a considerable number of cases, the cecum and occasionally the ileum is found adherent to the sac. These adhesions may at times be very firm and numerous. In such cases the appendix is frequently caught in these adhesions and a simple herniotomy would leave chronic appendicitis and adhesions with their concomitant symptoms of pain and intestinal disturbance. There are many reasons for these adhesions, among which are the continual irritations produced by the hernial contents passing through the inguinal canal. Productive inflammation is caused by trauma, especially by the pressure of a truss. The presence of these adhesions is another indication for exploring the region of the cecum and incidentally of removing the appendix. This is a harmless procedure if it is normal and an indicated one if it is found to be chronically inflamed and bound down with adhesions. There is no danger in the removal of the appendix through the hernial sac, no delay or appreciable prolongation of time and no complications. Recovery should be uneventful. Some difficulty may be encountered in locating and bringing down the appendix through the sac, but with a little practice this difficulty is overcome. Where any is met with, a recourse to the fixed landmarks will be of service. These are the brim of the pelvis and the attachment of the mesentery. Sweep fingers downward along the outer wall of the abdomen about one inch above the brim, and feel the attachment of the mesentery and the appendix. With a little gentle traction, aided either by a ring clamp or a piece of gauze, the cecum is mobilized in the wound, and with it the appendix, the removal of which is accomplished without difficulty. This routine removal of the appendix through the hernial wound stood me in good stead in one case where I found an acute appendicitis.

REPORT OF CASES.

CASE I.—M. K., aged thirty, was admitted to the People's Hospital in February, 1916. The combined operation was performed and the appendix found to be normal.

CASE II.—S. G., aged eight months, was admitted to the People's Hospital on February 26, 1916, for a strangulated right inguinal hernia. On releasing the constriction about the ring, the appendix was found in the sac and was red and inflamed. The appendix was removed and herniotomy performed. The patient made an uneventful recovery.

CASE III.—S. W., aged forty, was admitted to the People's Hospital, May 7, 1916, for a strangulated right inguinal hernia complicated by a teratoma of the testicle. The combined operation was performed and the appendix found to be normal.

CASE IV.—S. F., aged twenty-two, was admitted to the People's Hospital, October 3, 1916. In this case an acute appendicitis was found in the sac. The pain was located entirely in the large hernia. Recovery was uneventful.

CASE V.—J. G., aged thirty, was admitted to the Flower Hospital, October 21, 1916, for a double inguinal hernia. This patient had been suffering from chronic appendicitis for many years and had been advised to have his appendix removed. The combined operation was performed. The appendix was bound down by adhesions and on removal the lumen barely admitted a probe. Recovery was uneventful.

CASE VI.—W. K., aged one year, was admitted to the People's Hospital, January 17, 1917, for an incarcerated right inguinal hernia. In this case the appendix was found in the sac. Combined operation was performed; recovery was uneventful.

CASE VII.—F. W., aged thirty-seven, was admitted to the People's Hospital, March 14, 1917, for a right inguinal hernia complicated by an undescended testicle. The combined operation was performed. Appendix was normal.

CASE VIII.—A. W., aged eight, was admitted to the People's Hospital, April 15, 1917, for a double inguinal hernia. Combined operation was performed. The appendix showed acute catarrhal inflammation.

To conclude, the operation is simple and many of the appendices removed will be found to be pathological. There is no added danger in the operation, no undue prolongation of time in performing it, and the stay in the hospital is no longer.

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[1]This study included twenty-one cases, all of which will appear in the author's reprints.

Practical Therapeutics

THE NEW SPECIFIC THERAPY IN COLLAPSE*

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Favorable reports are continually appearing regarding the specific method of treating collapse through stimulation of the respiratory centre with the alkaloid alpha-lobelin.

For the general emergency service, such as that of first aid stations, ambulances, police and fire stations, mines, gas and electrical works and other industries, this new method is of prime importance as it is also for every physician.

The method has been tried and evaluated under such varying conditions as poisoning by narcotics, diphtheritic collapse, asphyxia neonatorum and imprisoned miners. It therefore seemed desirable to subject the clinical reports to critical selective analysis in order to determine and sharply define the syndrome indicating respiratory stimulation.

Based upon the pharmacological findings of exhaustive tests alpha-lobelin is clearly indicated in all forms of central respiratory depression, either partial or complete.

The preparation directly stimulates the respiratory centre causing respiratory movements, an increase in volume and a vigorous interchange of gases. It becomes effective immediately upon injection and continues so for from a half hour to an hour and a half. It can be repeated as frequently as desired, or its effect made continuous by prolonged infusion without danger of cumulative effect.

The accompanying respiratory curve of the pharmacologists Behrens and Pulewka shows the results of one of the twelve resuscitation experiments on cats.

After respiration had in some cases been partially and in others wholly stopped by a mixture of carbon monoxide with air, fresh air was introduced. Respiration did not improve and death seemed inevitable. Intravenous injection of 0.002 gram of alpha-lobelin immediately produced both increased frequency and amplitude of respiration and saved life in all twelve cases.

The application of alpha-lobelin is thus indicated in all conditions of apnea or oligopnea but not in dyspnea, for here the centre is already reacting to its physiological stimulus, carbon dioxide, and in turn acting forcibly upon the respiratory musculature. Apnea and oligopnea are the symptoms of respiratory depression encountered in the various special fields of medicine under different names.

In order to give the physician the right orientation for using alpha-lobelin we have endeavored to arrange the different forms of central respiratory depression into an etiological system.

In the conditions called collapse and shock the primary phenomenon is usually central respiratory depression with venosity of the blood; the cardiac depression appearing only secondarily as a consequence of venosity of the coronary circulation.

*Read before the New York Academy of Medicine.

The causes of partial or complete respiratory depression may be either psychic, as in fainting from fright; physical, as in electric shock and hemorrhage; or chemical.

Among the chemical causes, paralyses of the respiratory centre by poisoning play the most important rôle. Through the blood stream the respiratory centre is bathed with exogenous poisons, such as ether, chloroform, morphine, carbon monoxide gas (illuminating gas, stove gas, automobile and mine fumes)

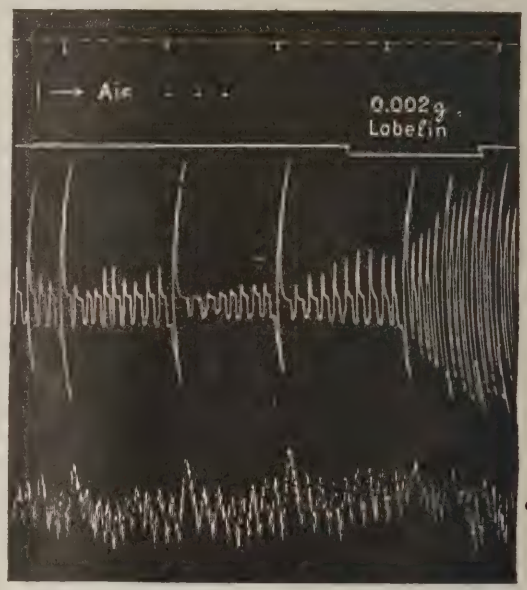

FIG. 1.—Respiratory curve. *a*, time thirty seconds; *b*, respiration; *c*, blood pressure.

and smoke, or by endogenous poisons, such as too high concentration of carbon dioxide or other catabolic products of metabolism (acidosis), the oxidation and elimination of which are disturbed.

Respiratory depression by endogenous poisons, recognizable by cyanosis, may appear in the course of almost every disease and may lead to complete collapse. This form appears physiologically in death. The most frequently observed forms of this group are asphyxia neonatorum, drowning and surgical shock.

All these forms of central respiratory depression are indications for the stimulation of the respiratory centre by alpha-lobelin. Artificial respiration sometimes requires as long as eight hours to produce the results given by alpha-lobelin in minutes.

The marked convenience of the ampule is in sharp contrast to the cumbersome equipment required for artificial lung ventilation or inhalation of oxygen.

The irrational treatment of emergency cases with a cardiac stimulant need no longer be practised with this specific respiratory stimulant at hand.

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THERAPEUTIC NOTES

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UNTOWARD EFFECTS OF TARTRATE OF BORAX AND POTASSIUM

It would appear that the tartrate of borax and potassium is not always devoid of untoward effects, as is generally assumed. Recently Professor Ide stated at a meeting of the Royal Academy of Medicine at Brussels, that borax medication might give rise to relaxation of the bladder.

One of his cases, which is well worth relating as it is almost equivalent to a laboratory experiment, was that of a male, aged nineteen years, who from infancy presented a strange phenomenon. Every time a sudden unexpected sound occurred, such as the slamming of a door, the patient would manifest a tetanic shock similar to one developing in a strychninized frog when the table on which the animal is lying is struck with the finger. The limbs on the right were more particularly thrown into a short tetanic paroxysm, but the entire body also was involved in the shock. There was no loss of consciousness during the attack and in less than a minute the patient had regained control of his muscles.

As to treatment, Professor Ide first gave bromide for a number of years, and later combined it with luminal; two grams of bromide and ten centigrams of luminal twice daily produced a relative amelioration of this abnormal irritability. Now, in order to mitigate an annoying furunculosis, Ide reduced the bromide to one gram daily and the luminal to five centigrams daily, and at the same time ordered three grams of tartrate of borax and potassium in twenty-four hours. During the first week of this medication, an entirely new phenomenon developed; at each paroxysm, the patient emptied his bladder in his clothes. This was the cause of great distress to the patient, who reduced his intake of fluids and urinated as often as possible, but regardless of this, he would wet his clothes several times a day. The tartrate was stopped and micturition became normal.

A month later the patient again took one gram of the tartrate, and again he urinated involuntarily, but when the drug was permanently given up, there was no return of the bladder disturbance.

HYPERTONIC SOLUTION OF SODIUM CHLORIDE IN GLAUCOMA

From considerable experience, Dr. L. Weekers, of Liège, has found that intravenous injections of a hypertonic solution of sodium chloride exercises a favorable action on the ocular hypertension in acute glaucoma. Weekers follows Cushing's method employed in cerebral hypertension, consisting of an intravenous injection of a sterilized watery solution of sodium chloride at thirty per cent., the average dose being five c. c. When given slowly at the rate of one c. c. a minute, no untoward effects occur. Occasionally, nervous subjects experience a slight malaise with some sweating, and in order to obviate these trifling disturbances, it is better to give the injection with the patient lying down.

One or several injections, given at intervals of one or two days, will be enough notably to decrease the ocular hypertension. But this effect is fleeting, lasting only a day or two, and even when repeated, the injections by themselves will be found insufficient to maintain the effect first produced, the ocular tension soon reaching the same degree as before treatment.

Nevertheless, Weekers recommends these injections as valuable for "normalizing" an eye which is the seat of acute glaucoma, before doing an iridectomy. In hemorrhagic and absolute glaucoma, the hypotensive effect of the injection usually is not very manifest. In chronic glaucoma and secondary glaucoma, the effect is nil or extremely slight.

TREATMENT OF GASTRIC ULCER

The part played by the enervation of the filaments of the vagus nerve in the surgical treatment of gastric ulcer has been carefully studied by Dr. Gianolla, surgeon in the Belgian army. He found that the nerves of the stomach form a system and that each one of them maintains an autonomous course in contact with the stomach and plays an independent part and a perfectly limited area of action.

There are three distinct bundles, the most important being at the lesser curvature, its branches being derived almost entirely from the pneumogastric. This bundle comprises an anterior and posterior branch derived from the corresponding pneumogastric nerve. The gastric area controlled by these two branches is the median portion of the stomach, otherwise put, the evacuating portion of the organ, the pylorus excepted. The nerve bundle supplying the greater curvature is derived from the coelic plexus, while the third bundle, or subpyloric

branch, comes from the hepatic quadrant. From the physiological viewpoint, total or partial enervation automatically produces vasodilatation in the corresponding area of the stomach, and this only in the parietal layer. This vasodilatation is accompanied by hypotonicity, a delay in the evacuation of the gastric contents, and decrease in amount of secretion.

Clinically, the indications for enervation comprise at the present writing, three pathological conditions, namely, 1, the lightning pains of locomotor ataxia; 2, in gastric ulcer combined with the usual surgical procedures, and 3, in gastropathies of the vagosympathetic type. Hence, gastric enervation is indicated in all cases of painful hypertonic gastric processes with hypersecretion.

Since we are speaking of gastric nerve surgery, I cannot refrain from referring to the work done by Dr. G. Lemoine, of Brussels, on the surgery of the sympathetic nerve, and especially of the gastric vagosympathetic. He has shown that the true sympathetic system controls the functions of vegetative life, hence governing the excitomotor function of the sudoriparous glands, the pilomotor and vasomotor apparatus, as well as a number of sphincters of the digestive tract, and presides over certain acts of inhibition of the musculature of this tract.

The vagus and pelvic nerve each participate in the innervation of the digestive system, and its embryological derivatives, namely, the bladder and respiratory system.

The respective actions of the vagus and sympathetic nerves on the motility of the stomach and gastric secretions is still a moot subject. Irritation of the vagus and splanchnic nerves may either produce a motor or inhibitory action, everything depending upon the state of tonicity of the peripheral mechanism. The local visceral nerve supply suffices for the local organic functions, but the extrinsic vagosympathetic system controls and adapts the functions in the event of possible disturbances of the normal physiology of the stomach.

The results of Lemoine's experimental work has led him to conclude that surgical intervention of the nervous system of the stomach is indicated in the gastric crises of tabes, gastric ulcer, and in the painful vagosympathetic syndromes. The operation consists either of elongation of the solar plexus and excision of the semilunar ganglia or partial or total enervation of the stomach and not infrequently the operative results are encouraging.

Treatment of Enteric Fever.—F. H. Thompson (*Clinical Journal,* July 2, 1924) says that the sooner the patient is in bed and kept in the recumbent position the better, for in a disease so prolonged and exhausting it is essential to conserve every ounce of his strength. Therefore the mere suspicion of this disease should cause the patient to be sent to bed at once, and he should not be allowed out of the recumbent position for any purpose whatever. The room should be large and airy, quiet, well ventilated, but free from draughts, situated where in winter the maximum sunlight is available and in summer shaded from its blaze. The temperature of the room should be about 60° F. The bed should be of the hospital pattern, three feet wide with a firm hair mattress, and so placed that it is readily accessible on bot sides. It should not face the window. Traine nurses should be engaged for day and night with, i possible, experience in enteric fever nursing. A rul ber sheet should always be under the patient with draw sheet above it. The draw sheet must be draw tight and have no creases; further, it must be kep dry and clean in order to avoid irritating the patient skin in any way, else bedsores may occur. Th patient must never be left alone. Every patien should be blanket bathed night and morning, and in addition, frequent tepid sponging is necessary i severe cases, carefully drying the part sponged be fore uncovering the next area of skin to be deal with. Bedsores should never occur, but great pre cautions are necessary to insure this. All parts ex posed to pressure must, after the morning and eve ning blanket bath, be rubbed with methylated spiri and dusted with powder, but it must be seen tha there is no caking of the powder. Further, the posi tion of the patient must be frequently changed fron the back, first to one side, then to another. He ca be kept in the desired position by pillows. In sever cases a water or air bed may be necessary. Afte each motion the skin of the buttocks and thighs mus be carefully sponged, dried and powdered. An out look should be kept for retention of urine. Th mouth must receive careful and frequent attention being cleansed every three or four hours with a weal solution of boric acid, then moistened with glycerin or borax, not forgetting the lips, and finally a dro or two of fresh lemon juice should be placed on th dorsum of the tongue. The teeth should also b brushed twice or thrice daily.

The patient must be given plenty of water t drink, and milk must not be used for quenchin thirst, but as an article of diet only. Various authori ties give widely differing opinions as to the prope diet for the enteric fever patient, but the point t bear in mind is that in so far as possible his strengt must be maintained, and that consequently the die must vary within limits according to the severity o the attack, the powers of digestion, and the persona peculiarities. Large quantities of food may sui some but do harm to others. It is necessary for th physician to study each case and avoid a routine diet Speaking generally, milk is the best food. It shoul be given at regular intervals and in stated quanti ties, though sleep must not be interfered with un duly. The patient should be fed about every tw hours, but at night if he is sleeping the interva may be prolonged to four hours, so long as in twenty four hours he takes three pints (if a child, two pints in feedings of about equal quantity.

Thyroidin Treatment of the Nephroses.—Do menico Campanacci (*Wiener klinische Wochen schrift,* March 13, 1924) used thyroidin treatmen in three patients, aged three, eighteen and forty eight, respectively, suffering from nephritis with dropsy but without retention of nitrogen, all three of whom recovered. The dose advocated by Eppin ger, namely, beginning with 0.3 gram of the dry sub stance daily and increasing it gradually up to 1.2 to 1.8 gram daily and even more, was followed. This treatment requires great care of application and constant medical observation.

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Present Day Management of Uncomplicated Labor*

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Chicago

It is an undisputed fact that a large number of women lose their lives every year as the direct result of childbirth; and of those who do not lose their lives, about one half suffer for years from the effects of labor. Approximately one half of our gynecological operations are necessitated by the damage resulting from labor. Aside from the maternal mortality and morbidity, there is a large fetal death rate. According to De Lee, in the United States alone about twenty thousand mothers and over one hundred thousand babies lose their lives every year as the result of childbirth. These figures are frightful; but fortunately most of these deaths and injuries are preventable. Careful observation of patients during pregnancy and the proper conduct of labor will considerably reduce both maternal and fetal mortality and morbidity.

Prophylaxis is most essential in pregnancy and for its success education of the public is necessary. The layman must be made to realize that a labor case begins at the time of conception and that it is important for the pregnant woman to see a physician as soon as she knows she is pregnant. Once the patient is in the hands of a physician, the responsibility rests largely upon him. He must properly instruct the patient and guide her through pregnancy so that she and her child can go through the ordeal of labor with a minimum of injury.

Since a labor case begins at the time of conception, it is within the scope of this paper to discuss prenatal care briefly. At the patient's first visit there are certain fundamental things a physician should do. First of all it is essential that a history along certain lines be taken. It may help to know the childbirth experiences of the patient's mother and sisters and the patient's past illnesses and operations. If the patient is a multipara, her past obstetrical history is important because as a rule a woman shows her obstetrical form in her first labor. After taking the history, the patient should be given a careful general examination which should include not only the heart and lungs but also possible sources of infection such as the teeth, tonsils, sinuses, etc. Of great importance is the special obstetrical examination which consists of external and internal measurements, abdominal and vaginal examinations.

The patient should be seen by the physician at least every three weeks during the first seven months of pregnancy and every two weeks thereafter. During these visits the blood pressure should be taken, the urine examined and the general health of the patient observed. From time to time an abdominal examination should be made and the fetal heart auscultated.

At the first visit certain information should be given the patient, preferably in typewritten or printed form. The patient should be told to regulate her diet so as to eliminate as much meat, fish and other proteins as is convenient She should drink an abundance of water and see that her bowels move daily. A certain amount of light, outdoor exercise, usually walking, is essential. Circular constrictions, especially circular garters, should be forbidden. Sexual intercourse should be restricted during pregnancy and absolutely forbidden during the last six weeks. The physician should be notified if any of the following symptoms arise: edema, severe headaches, visual disturbances, diminished urinary output, bleeding, excessive vomiting, marked constipation or epigastric pain.

When a woman goes into labor the best place for the delivery is a hospital; but unfortunately the majority of women are still delivered in their homes. Of prime importance for the physician who delivers his patients at home, is preparedness, not only in knowledge but also with instruments. If possible, an assistant, a physician or nurse should be present.

When called to a patient in labor it is advisable to respond as quickly as possible. A careful abdominal examination should be made to determine the exact presentation and position of the child and the fetal heart tones should be counted. The amount of effacement and dilatation of the cervix should be determined, preferably by rectal examination. With a little experience one is able to conduct fully ninety-five per cent. of all labors without vaginal examinations. The blood pressure should be measured and the urine examined because a sudden

*Read before the Lee County Medical Society, Illinois, January 3, 1925.

change may have taken place. If the heart and lungs have not been examined before, they should be at this time.

The general plan of treatment in the first stage of labor is one of watchful expectancy. This consists of lessening the strain of labor by morphine and scopolamine, or morphine and atropine, seeing that the bladder and rectum are kept empty and that

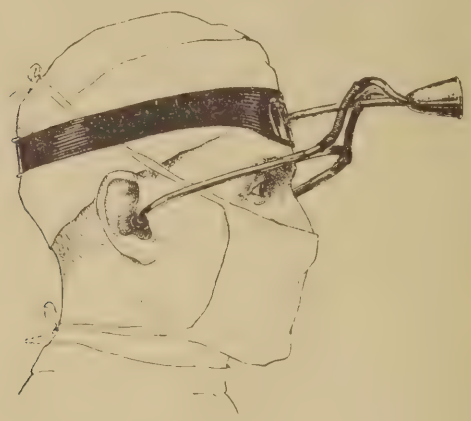

FIG. 1.—The De Lee-Hillis stethoscope.

the patient takes nourishment. Careful observation of the fetal heart tones is important. The patient should not be permitted to bear down during the first stage as it is useless and will waste her strength which will be necessary for the second stage. Furthermore, expulsive efforts may do harm by forcing the undilated cervix downward and prepare the way for a future prolapse of the uterus.

Throughout labor one must watch for signs of trouble. Nature usually throws out little signals, which if properly evaluated, give us a clue that something is wrong. If there is evident disproportion between the child's head and the pelvis (and hydroecphalus can be excluded), Cæsarean section is of course indicated. If uncertain about disproportion, the patient should be given a test of labor to see whether the head will enter the pelvis. If after a reasonable length of time the head fails to enter the pelvis, abdominal delivery is advisable. It is necessary to recognize a disproportion early, else the patient will be permitted to remain in labor a long time, the membranes may rupture, infection may set in and an attempt at forceps delivery be made before the true condition is recognized. It is then too late to deliver a live baby without danger to the mother.

Once the second stage has begun the physician should not leave the patient until delivery has been completed. By the second stage is meant the period which extends from the time of complete dilatation of the cervix to the time the entire fetus is expelled.

When the second stage is reached, the patient and bed should be prepared for delivery and sterile instruments, solutions, cord tie, etc., should be placed near the bed. In multiparous women these preparations should be made before the cervix is fully dilated.

Essentially four main points are to be considered during the second stage, namely, asepsis and antisepsis, anesthesia, protection of the life of the child and the preservation of the perineum.

All are agreed that asepsis and antisepsis are basi principles. In the home they are difficult to carr out; but there is no doubt whatever that they can b practised there effectively. As regards anesthesi there is almost unanimous opinion that women shoul be relieved of the pains of labor as much as possible but various types of anesthesia are employe It is inadvisable to give narcotic drugs such a morphine during the second stage because of th likelihood of harm to the child, even though it slight. Inhalation anesthesia which may be in th form of ether, nitrous oxide and oxygen, ethylene c chloroform may be used. We prefer ether or ethy lene. With the beginning of each uterine contrac tion felt by the hand on the abdomen, a few whif of the anesthetic are given and the moment the hea passes through the vulva, the anesthesia is deepene

It can be said with assurance as regards the pre servation of fetal life, that attention to the child du ing the second stage will save many lives. On should watch carefully for the first signs of asphyxi and this is done by listening to the fetal heart tone every five minutes or oftener when indicated. Fo this purpose we employ the De Lee-Hillis stetho scope (Fig. 1) which rests on the head and can b kept there during spontaneous deliveries and forcep operations. Both hands remain free and sterile a all times even when the fetal heart tones are care fully controlled.

After every spontaneous delivery of a full ter child in a primipara there is some damage to th perineum. The urogenital septum is always rup tured, the connective tissue is torn in many place the layers of fascia are loosened, the levator a muscles are usually lacerated and in general all th tissues are bruised. This condition is usually pre vented by a timely episiotomy which should be performed in most primiparæ with full term babies. If an episiotomy is not done, tears may be minimized by delivering the head slowly and in forced flexion.

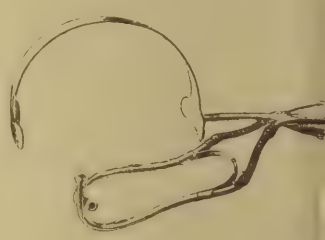

FIG. 2.—Headband of steel.

If there is atony of the uterus and the patient has a pendulous abdomen, a tight binder will help. If there is delay after the head is well down on the perineum, both hands may be spread evenly over the fundus of the uterus and gentle pressure exerted the axis of the outlet; but only during uterin contractions. This method, however, is not witho danger. Episiotomy should not be forgotten a if these measures fail, forceps are indicated. this country, at least seventy-five per cent. of a forceps operations are done for uterine atony.

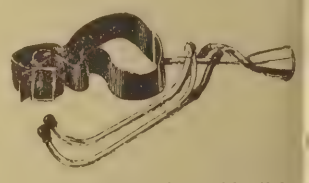

FIG. 3.—Headband of silk, light and transportable.

I have purposely avoided the mention of pituitri

We never use this drug until after the baby is born. The only time pituitrin may be advisable before delivery of the child is for uterine atony in a multipara when the head is on the pelvic floor and the bony outlet is not contracted. Even here we prefer the forceps because we can control the forceps but we cannot always control pituitrin, even with anesthesia. Furthermore, in the cases where the use of pituitrin might come into question, the forceps operations are very easily and quickly performed without injury to mother or child.

In a considerable number of cases, more than is usually recognized, the baby's occiput is posterior. In these cases, labor usually lasts a long time; hence the uterus becomes exhausted and the patient tired out. These patients should be given morphine and scopolamine. Fortunately in most of the cases the occiput rotates anteriorly and delivers spontaneously. Despite this, however, more babies are lost from occiput posterior than from any other one cause (De Lee). This is essentially due to failure in making a correct diagnosis early in labor and yet the diagnosis is relatively easy. Labor pains are usually weak and irregular and early rupture of the membranes is frequent. The head remains high for a long time and dilatation of the cervix is slow because the head does not fit well. Abdominally a distinct hollow may be seen over the symphysis. The heart tones are usually deep in the flank but may be heard on the side opposite the baby's back. The small parts are extremely prominent anteriorly. Internal examination reveals the head high up, partly deflected and the large fontanelle more accessible than usual because it is nearer the centre of the pelvis. The small fontanelle is near the sacrum. If the caput succedaneum is so large that the sutures and fontanelles are hard to identify, locate the ear and feel the tragus. The latter will always indicate the direction of the occiput. If there is no disproportion between the head and the pelvis, the treatment is expectant unless an indication for interference arises.

If in a case of occiput posterior the patient cannot deliver herself spontaneously within a reasonable length of time after the cervix is completely dilated, she should be anesthetized. With the hand, the fetal head should be rotated anteriorly before or after an episiotomy has been performed, then forceps should be applied and the head delivered. When the bag of waters is intact and the head high but there is no disproportion between the head and the pelvis, a podalic version followed by extraction may be performed. If in a case where the head is high and labor has lasted a long time, the cervix is not fully dilated and effaced, especially if the patient is an elderly primipara in good condition, a low or cervical Cæsarean section should be done.

While it is generally advisable to follow a policy of watchful waiting in the second stage just as in the first stage, one should not allow a woman to remain in labor too long. We should not wait to see what a patient can endure but simply what she can accomplish. To wait too long may mean death to both mother and child. On the other hand, because the patient makes a great deal of noise and the family insists that something be done, one should not interfere too soon. If a physician feels he can-

FIG. 4.—The author's anal shield.

not take care of a patient alone he should not hesitate to call for assistance.

The dangers of the second stage to the child are numerous and almost every kind of injury has been caused by the forces of spontaneous labor. In general, four per cent. of all babies die during labor and a fair proportion of these deaths occur in natural unassisted delivery. Neurologists as well as obstetricians have long pointed out the connection between prolonged hard labor and epilepsy, idiocy, cerebral palsy, and other similar conditions. In fact statistics seem to show that proper instrumental delivery is safer than prolonged, hard, unassisted labor; for it seems that the brief and moderate compression of the head in a properly performed forceps operation is less dangerous to the integrity of the fetal brain than the prolonged pounding and congestion it suffers from a hard spontaneous delivery.

Episiotomy likewise saves the child's head from prolonged compression, it shortens the duration of labor, it forestalls asphyxia and it prevents ragged lacerations which are otherwise almost inevitable.

Of the various types of episiotomy we prefer the mediolateral, made at the time the head stretches the levator ani muscles. This is recognized by the opening of the anus and the dislocation of the anus downward and forward. The patient is given a few whiffs of anesthetic as the cut is made and the latter is not repaired until after the expulsion of the placenta. In the home it is better to repair the episiotomy wound with figure of eight silkwormgut sutures which take in all the layers. In the hospital, if the asepsis has been perfect, the structures may be sutured with catgut, layer by layer in anatomicosurgical fashion. Care must be taken to prevent instruments and suture material from coming in contact with the anus. To avoid such contact I devised a small metal anal shield (Fig. 4). By means of a properly performed episiotomy and repair, almost virginal conditions are restored.

When forceps are to be applied, five conditions must be fulfilled: First, there must be no disproportion between the baby's head and the mother's pelvis. Second, the cervix must be completely effaced and dilated. Third, the head must be engaged; that is, the greatest diameter must be below the inlet of the pelvis. When the lowest part of the fetal skull, not the caput, is at the level of the ischial spines, the head is engaged. Fourth, the bag of waters must be ruptured, and fifth, the baby must be living. After the application of the forceps blades and before they are locked, one should listen to the fetal heart tones. If the latter remain regular, the forceps are locked. If the heart tones change, it usually means that a loop of cord is being compressed by the forceps. In this event, the forceps should be removed and reapplied. If the heart tones again change, it is better to deliver the child by version and extraction.

In doing a forceps delivery one should be absolutely certain of the position of the occiput. Palpation of the baby's ears will always verify the diagnosis. The bladder should be catheterized before every forceps delivery. The operator should sit comfortably with his elbows at the side and in making traction he should seldom use more force than is furnished by the biceps muscles. Time should not be considered; but one must listen to the fetal heart tones after every traction or two. Traction should be intermittent and not accompanied by pendulous or twisting motions. In primiparæ an episiotomy should be performed, preferably after the application of the forceps to avoid an unnecessary loss of blood.

In breech cases a policy of expectancy should be followed unless an indication for quick delivery arises. In multiparæ little trouble will be encountered usually, but in primiparæ there is a large fetal mortality and morbidity and a high maternal morbidity. One should not interfere until the baby's buttocks have been delivered over the perineum, unless a definite indication arises. In all primiparæ if the baby is large, a deep episiotomy should be performed. Great haste is not essential and care should be taken to avoid fractures. Pulling on the child's neck is bad practice as it may result in Erb's paralysis, fracture of the cervical vertebræ and other injuries. Pressure on the child's head from above is the essential thing in the delivery of the after coming head; but the pressure should not be exerted blindly. The head must be in the proper attitude before aid is given from above and much force should never be used. If the head is in the pelvic cavity and difficulty is encountered, one should not use force but forceps should be applied to the after coming head. Hence, before doing a breech extraction (or a version and extraction) a pair of forceps should be sterilized with the other instruments.

Face presentations are usually delivered spontaneously with the chin anterior. Delivery of a full-term child with the chin posterior, either spontaneously or instrumentally, is almost out of the question. If forceps are to be applied, the chin must be rotated anteriorly or at least to the transverse diameter. One may convert a face presentation into an occiput presentation or do a version and extraction. In all cases where the face is delivered first, a deep episiotomy should be performed.

Immediately after a baby is born, regardless of the type of delivery, it is a good plan to give the mother an ampoule of pituitrin. This hastens separation of the placenta and saves blood.

The management of the third stage of labor is more important than most physicians realize, for more women die from accidents occurring in the third stage than during the other two combined. One should treat the third stage as follows: After the child is born, place the hand on the uterus but do not massage. Wait until signs of placental separation have occurred. These are, advance of the cord from the vulva, rising of the uterus in the abdominal cavity, change in shape of the uterus from a globular one to one with a sharp ridge at the fundus and diminution in size and hardening of the uterus. When these signs are noted, gentle pressure on the contracted uterus will readily expel the placenta. If after one hour the placenta does not separate, the Credé method may be used, first making sure the bladder is empty and the uterus well contracted and in the midline. After delivery of the placenta and membranes, they should be examined for missing pieces. In the home it is best not to invade the uterus for missing pieces of membrane unless there is hemorrhage; but pieces of placenta had better be removed without delay. Never pull on a cord to deliver the placenta. If a placenta is adherent and manual removal must be done, the strictest aseptic precautions should be taken. The gloves should be changed before invading the uterus and it is a good plan to give the patient ergot during the first few days of the puerperium. We give nearly all patients ergot immediately after the placenta has been delivered.

If hemorrhage results after expulsion of the placenta and membranes and the latter are complete, the bleeding is due to lacerations or to atony of the uterus. If due to lacerations, immediate repair should be done. If due to atony, indicated by flabbiness of the uterus, and if pituitrin and ergot given hypodermically do not suffice, also if pituitrin given into the uterine muscle through the abdominal wall does not help, the uterine cavity should be packed tightly with gauze. Asepsis should not be sacrificed for speed in an effort to save blood.

When the third stage is over, the perineum should be carefully inspected for lacerations and if any are found they should be repaired immediately. Episiotomies should be repaired at this time also.

If a child is born asphyxiated, it is not necessary to use forcible means to resuscitate it. First of all, warmth is essential; hence a towel, preferably a warm one, is wrapped around the baby. The respiratory passages must be clear and if it is necessary to clear them artifically the best means is a tracheal catheter. If respirations do not begin after this, air should be blown into the child's lungs through the tracheal catheter but with extreme gentleness. These measures will resuscitate practically every baby which can be reanimated.

Before leaving a patient's home or hospital, the physician should assure himself that the mother and child are in good condition. The uterus should be firm, there should be no hemorrhage, the placenta and membranes intact, and the mother's temperature and pulse recorded. The child should be examined to see if it is breathing properly, if its color is good, its cord properly tied, and whether fractures are present. The instillation of silver nitrate should not be forgotten.

During the puerperium, the patient should be carefully watched. The diet should be looked after and also the bladder and bowels. The uterus should be palpated and the lochia observed. The breast and nipples should be given consideration and the temperature and pulse properly recorded.

After discharging a patient, it is advisable to tell her to return for an examination at the end of six or eight weeks. At that time, a pelvic examination will reveal whether involution has taken place, whether the uterus is retroverted and the result of the perineal repair if any had been done.

In closing, I should like to emphasize the present unnecessarily high maternal and fetal mortality and morbidity. Physicians can reduce this considerably by careful observation of their patients during pregnancy, by the proper management of labor and above all, by the education of their patients.

426 East Fifty-first Street.

The Clinical Aspects of Abortions*

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When the advocates of birth control can offer an absolutely efficient contraceptive, when the moral attitude and economic situation of the public renders the criminal abortionist an unnecessary element in our midst, and when the practice of obstetrics has reached the perfection of carrying every pregnant woman through to a normal postpartum condition, then, and then only, may we expect a reduction in the present number of abortions. Such a Utopian state of affairs is so far away in the dim future that the problem of interrupted pregnancy in many of its aspects is still a fruitful source of medical and, at times, legal discussion.

The clinical picture presented by a large group of aborting women has seemed of sufficient interest to warrant my presenting it. I am indebted to Dr. J. H. Girvin, chief of the Gynecological Service at the Presbyterian Hospital, for the privilege of reviewing the histories of one hundred cases of abortion occurring in his service. These histories form the basis of my study.

The ages of these women when arranged graphically show two peaks; one high sharp point at the age of twenty-three, and a second sharp incline to an apex of thirty years of age with a broad drop through the next two years. A survey of the histories of the women in these peaks reveals definitely that the first contains a large number of primiparæ in whom the abortion had been induced, either by themselves or others, and that the second includes mostly multiparæ, who presented varying degrees of pelvic pathology, uterine displacements or residual low grade inflammations of the pelvic organs.

We found that in the abortions studied it was the first pregnancy in twenty-one women, all under twenty-five years of age, and in nine of these the abortions were admittedly criminal. In the seventy-nine multiparæ it was the second pregnancy in twelve, the third in fifteen; and the relation of the number of abortions past and present to the births at term agrees with the generally accepted ratio of one abortion to four births at term. In other words about twenty per cent. of all pregnancies are interrupted. A survey of the social status shows but two single women, and both presented febrile criminal abortions.

Duration of Pregnancy

The duration of the pregnancies indicated that the majority, eighty per cent., aborted during the second and third months, only one carried as far as the fifth month. The presence of the fetus was noted twenty times, either expelled after admission or removed in a few cases of inevitable abortion at operation. In eleven instances it was noted that the fetus had been passed before admission. This interesting fact, that the fetus is seen in but one third of the cases, supports the observation of Meyer, who studied the material at the Carnegie Institute of Embryology, and concluded that the death of the fetus preceded the clinical manifestations of a spontaneous abortion by an average of six weeks. The fetus, macerated or disintegrated by such a long period of autolysis, might easily escape notice in many cases.

The previous medical history of the cases where induction might reasonably be excluded was inquired into. In a period of five years before conception in the primiparæ, or since the last pregnancy in the

*From the Gynecological Service of the Presbyterian Hospital, Philadelphia. Read before The John Morgan Medical Society, December, 1924.

multiparæ influenza had occurred in nine, pneumonia in four, tuberculosis in three, heart disease in two, and tonsillitis and lues in one each. It is difficult to ascribe the effect of any of these diseases as an etiological factor, except in the one case where pneumonia complicated a five months' pregnancy. Syphilis seems to be a negligible factor in the production of abortion. In but one case was the history of specific infection elicited; here the Wassermann reaction was positive. In seventy-four other cases the Wassermann reaction was negative.

PREVIOUS SURGICAL OPERATIONS

Surgical procedures had been previously performed in twenty-six of these women. Six can be immediately eliminated, as criminal induction was admitted. In nine cases where plastic operations on the perineum or cervix, with or without suspension of the uterus or appendectomy, no cause could be assigned for the abortion, except in one case where the woman had fallen down a flight of stairs. Five women had been previously curetted, with or without accompanying suspension of the uterus, salpingectomy or appendectomy; in none could a cause for the abortion be given. In the remainder, six in number, abdominal operations, not for pelvic disease, had been performed, and in them no cause could be assigned for the abortion. In most of these cases pelvic examination under anesthesia disclosed little pathology; in two cases definite evidence of gross pelvic pathology, not associated with the previous operation, was present. Presumably in some others the indefinite residuum of previous pelvic or uterine disease had been sufficient to prevent a long continuance of the pregnancy. As an evidence of old endocervicitis and presumably some degree of endometritis it may be added that in over half of the cases in the series the patients complained of a marked degree of leucorrhea.

CAUSES

When the possible cause was questioned for, or when this was stated, it was found that criminal induction had been performed in thirty-four cases, no cause could be assigned in fifty-two, heavy labor or trauma of various sorts in eight, while fibroid tumor, pneumonia, pernicious vomiting, cervical implantation, missed abortion and fright completed the list. In the cases where no cause could be given by the patient retroflexion of the uterus was present in ten, laceration of the cervix and endocervicitis in four, prolapse of the uterus in one and traces of old pelvic peritonitis or cellulitis, as evidenced by fixation, scars or tenderness in three cases.

In many of these cases the patients showed an anemia. Seven had below forty per cent. hemoglobin, nine below fifty per cent., and seventeen below sixty per cent. A total of sixty-one patients showed a hemoglobin of seventy per cent. or less. In three of these cases transfusion was performed, in most of the others iron and arsenic was exhibited by hypodermic during their stay in the hospital and various hematinics while they remained under observation.

An abortion was considered as febrile if a temperature of 100.4° or higher, sustained for twenty-four hours, was recorded. There have been twenty-eight such cases in the series, in fourteen of them the abortion had been induced. Blood cultures were taken thirty-seven times in these febrile cases. In two the cultures showed hemolytic streptococci, both patients recovered with the administration of antistreptococcus serum, in addition to other measures. In practically the whole series a culture was made from the interior of the uterus at the time of operation, or from the cervix if not operated upon. Fifteen positive results were reported by the laboratory in eight the abortion had been induced, in six the abortion was febrile. The Staphylococcus aureus was found nine times, the Bacillus coli five times, and the Streptococcus hemolyticus and nonhemolyticus once each. No positive blood cultures were found in these cases of positive uterine cultures. The findings here are of apparently negative value but may at times explain the origin of a blood stream infection.

SURGICAL TREATMENT

Eighty-eight patients were operated upon. This operation consisted of the early digital and instrumental evacuation of the uterus, with a blunt placental forceps; in a few cases a dull curette was used. Operation was delayed a short time in a few febrile, apparently septic, cases for the purpose of observation. The twelve cases in which the patients were not operated on include nine apparently complete abortions, one inevitable abortion, complete after packing for hemorrhage, and two threatened abortions, in both of which there was a history of attempted criminal induction.

The effect of early operation in twenty-five febrile cases has been a rapid lowering of the temperature to normal, within forty-eight hours in sixteen cases. In two cases of criminal abortion the temperature remained elevated for fourteen and twenty-one days, the uterine cultures showed Staphylococcus aureus and Stereptococcus hemolyticus in one, and Bacillus coli in the second, in which there was an associated pelvic cellulitis. In no instance has the removal of the uterine content in a febrile case given rise to a blood stream infection. In one case in which the patient was afebrile on admission and at time of operation, a postoperative fever three days later was due to a blood stream infection with the Streptococcus hemolyticus. This cleared up under serum treatment.

In the second case, in which also the patient was afebrile on admission and at operation, a marked temperature rise for three days with sterile blood cultures was observed. The careful emptying of the uterus in spite of a mild fever rids the woman of a focus of infection, for the most part of low grade virulence, favors involution of the uterus, and quickens convalescence, with a shorter stay in the hospital. The duration of the hospitalization ranged from five to fifty-two days, the latter in a case of pneumonia, with an average of twelve days for all cases.

Histological examination of the specimens removed at operation disclosed nothing noteworthy. Spirochetes were not found in any of the fetuses or other tissues when searched for. Fibrosis of the chorionic villi, infection and various stages of degeneration of the decidua have been noted.

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Eye Changes in Pregnancy

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CONTRACTION OF THE VISUAL FIELDS FROM ENLARGEMENT OF THE HYPOPHYSIS

That pregnancy is responsible for enlargement of the pituitary body has been demonstrated satisfactorily. In 1922 Finley of Havana reported "that during pregnancy there often occurs, as a result of the normal hypertrophy of the pituitary gland in connection with this state, a compression of the chiasm which manifests itself by changes in the visual fields in the nature of a bitemporal contraction, which varies in degree according to the amount of compression suffered, this depending on the corresponding amount of hypertrophy and on the anatomical peculiarities of the case which may favor or hinder this compression."

There is no impairment of the central vision due to the hypophyseal enlargement and the fields are not contracted enough to interfere with the patient's getting about safely. The phenomenon manifests itself during the last few weeks of pregnancy, and disappears after parturition. It occurs in primiparæ and multiparæ. While this condition is interesting, it probably is not of great importance in its immediate manifestations, and it is believed that there are no unfortunate late results.

ATROPHY OF THE OPTIC NERVE

Rarely optic nerve atrophy unassociated with retinitis develops late in pregnancy. This is thought to be the result of retrobulbar neuritis caused by the toxemia of pregnancy. It may result in partial or complete pallor of the nerve heads with partial or complete blindness. With the knowledge that the hypophysis is enlarged late in pregnancy it may be well for us to have in mind the possibility that in rare cases the enlargement might be great enough to cause pressure atrophy of the chiasm and optic nerves.

CHOROIDITIS

Although not generally recognized as a manifestation of toxemia of pregnancy, I think that choroiditis should be given a place among the important eye conditions caused by the gravid state. I have seen several cases of well developed exudative inflammation of the choroid in pregnant women who were sound except for their pregnant condition. The choroid is a highly vascular structure, and pathological response to pregnancy toxemia should not be considered a strange thing. In choroiditis the prognosis as to vision depends upon the location of the lesion. The portion of the retina which corresponds to the choroidal lesion is robbed of its function. If the lesion is in the macula, which provides central vision, serious permanent impairment of sight will result; but if the choroidal inflammation is away from the macula, the resulting blind area will not be important. Fortunately, the choroiditis most often affects only one eye, so there is small chance of serious impairment of sight in both eyes. In cases of development of choroiditis in both eyes or in a patient's only good eye, induction of labor might be wise.

SPASM OF ACCOMMODATION

Rarely the pregnant woman may be alarmed by impairment of her distant vision due to overaction of the ciliary muscle, resulting in the equivalent of myopia. She sees well (perhaps better than normal) for reading, but at a distance her sight is blurred, and it may be necessary for her to wear concave lenses in order to have good distance sight. Presumably toxic substances stimulate the muscles of accommodation to a condition of mild spasm. The condition may continue for a few weeks after delivery, but relaxation gradually returns without serious consequences.

HEMORRHAGIC RETINITIS

This is the best known eye complication of pregnancy, and the most important. Its presence may carry heavy weight with the obstetrician in his decision to induce labor, both because of its danger to the patient's sight and because of its significance in regard to the general condition of the patient. Without going into technical detail, it may be said that there are two types of retinitis in pregnancy, one associated with acute toxemia and the other with chronic cardiorenal disease. The retinitis appears during the latter part of pregnancy, and may occur in either primiparas or multiparas.

Each case of pregnancy with hemorrhagic retinitis should be judged by itself, but it can be said that the development of retinitis is always of serious import, and usually indicates prompt termination of labor. It is not necessary for me to say here that the lives of both mother and baby are at stake. As to the mother's eyes it may be said that some danger always results from retinitis. Blindness either complete or partial in both eyes is the usual outcome if the condition is allowed to remain long. In some cases, however, the optic nerve and retina are not badly injured and useful vision may result. Fortunately, the development of retinitis in one pregnancy does not mean that it will appear in succeeding pregnancies.

UREMIC AMAUROSIS

While all obstetricians are familiar with hemorrhagic retinitis of pregnancy many do not know of the rarer condition of uremic amaurosis, quite a different sort of a process. In this condition the patient loses the sight in both eyes, but ophthalmoscopic examination reveals nothing abnormal. The blindness is due to the toxic effect of uremia on the brain cells and not to involvement of the optic nerves or eye structures. Inasmuch as the process is supranuclear the pupils react to light, both directly and consensually, although the patient is blind. If the patient recovers from her uremia the sight is surely restored, and in this regard the prognosis is quite different from that in albuminuric retinitis.

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Gonorrhea in Women*

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Considering its prevalence and its farreaching influence on the health and bodily resistance of the subject, gonorrhea in women must be regarded as one of the most important gynecological diseases. Because of the greater complexity of the female genital tract, this disease is far more varied and dangerous in women, both to life and health, than in men.

Neisser states that with the exception of measles, gonorrhea is the most widespread of all diseases. "It is the most potent factor in the production of involuntary race suicide, and by sterilization and abortion does more to depopulate the country than does any other cause (Norris). There is probably no other disease that has caused as much suffering and sorrow throughout the world as has gonorrhea.

Nöggerath said that in New York city eight hundred out of one thousand married men have gonorrhea; that ninety per cent. of all these have not been cured and can infect their wives; that in New York eighty per cent. of married women, at least, have gonorrhea, or the results of it. While, at first glance, this seems an extravagant statement, our own observations tally with Nöggerath's conclusion (Polak).

In France, where statistics have been accurately compiled, it has been found that of ten million families, two millions are without issue; these results, according to Neisser, would tend to show that gonorrhea is the etiological factor in nearly one million sterile marriages, and this does not include the vast number of "one child sterilities" due to this cause.

The period of inoculation with gonorrhea varies from twelve hours to a week. The part most likely to be infected depends largely on the point of contact. If the introitus is small, the urethra and Bartholin ducts are most liable to be the seat of the initial lesion; while in the parous woman the cervix is most often the seat of the primary infection. The infection almost invariably begins as a surface inflammation, and spreads more or less deeply into the underlying structures. The gonococcus may lie dormant in the cervical glands for a prolonged period and spring into activity under proper stimulus. On the other hand protracted encapsulation, such as often occurs in the adnexa, tends to destroy the organism.

Gonorrhea may exist in the genital tract during the period of pregnancy without clinical manifestations and become active during the puerperium; this explains some of the late postpartum infections. It has been proved that by passing gonococci through a second subject they may acquire added virulence; this explains how an apparently cured subject of chronic or latent gonorrhea may infect his wife, and in turn be reinfected by her. The virulence of the gonococcus is increased by menstruation and during pregnancy, fortunately the dried gonorrheal secretion is innocuous. Married persons infected with the gonococcus may become more or less immune to their own particular organism, so that the symptoms and signs of the disease may subside completely. If these persons live apart from each other for a considerable period of time, upon resuming sexual intercourse a violent gonorrhea may be set up in either one, although both have been virtuous during separation. Or if the infection is transferred from a married couple to a third person and then again to one of the original incumbents, the gonococcus will have become more virulent and is capable of producing a violent fresh infection in the recipients. There exists to the gonococcus no immunity such as belongs to most other microbic organisms.

Under ordinary conditions the gonococcus rarely produces serious lesions in localities invested by adult squamous epithelium such as the vagina, the inflammatory reaction being due to the toxin laden discharge from the lesion higher up. In the cervical and corporeal mucosa, however, a different condition exists; the surface epithelium becomes swollen and the cells become separated from one another by the inflammatory exudate, desquamation takes place, and many of the cells are replaced by a modified epithelium, or cicatricial tissue may result. The gonococci quickly gains access to the glands and similar changes occur in the investing cells; and the exudate is poured out into the periglandular tissues, so that the gland openings become occluded and filled with inflammatory exudate, with the formation of pseudoabscesses. As the process advances, the epithelium and its basement membrane may be entirely destroyed, and a true abscess surrounded by a pyogenic membrane may form. Such is the pathology of an abscess of Bartholin's glands or of occlusion cysts in the cervix. Gonococci in the glands may persist long after a surface cure has been effected; and from this location reinfection frequently occurs. This tendency to glandular penetration, which is possessed by the gonococcus, accounts for the resistance of the coccus to gonococcides applied to mucous surfaces. From the surface and gland crypts the gonococcus escapes into the stroma and underlying muscular layer, and in severe tubal infections even unto the serosa and adjacent structures. This migration excites a local tissue reaction, so that the submucous structures become swollen and infiltrated with inflammatory products and the contiguous bloodvessels become intensely congested. These reactionary changes vary with the severity of the infection, the stage of the disease and the anatomical character of the tissue involved. The underlying swelling and edema are accountable for a desquamation of the surface epithelium and distortion of the parts by the long continued inflammation in the depths of the mucosa with the formation of cicatrices, which interfere with the lymphatic drainage and consequently allow a continuance of the symptoms after all signs of active inflammation have subsided.

This is particularly evident in intraperitoneal pelvic lesions where adhesions and contractions so distort the pelvic anatomy that operative measures for relief must be instituted for the patient's comfort and health, rather than for the cure of the infection.

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The most marked pathological changes are usually found near the surface, as the tissue in this locality seldom undergoes complete resolution. The chief characteristic of gonorrheal inflammation is its chronicity.

The foregoing will suffice as an introduction to the presentation of the symptoms and treatment of the various organs involved.

INFECTIONS OF SKENE'S GLANDS

Skene's glands, or the paraurethral ducts, are two small tubules which lie on each side near the floor of the female urethra and extend up from the meatus urinarius for about three fourths of an inch; these ducts open just anterior to the centre of the urethral lips. Their chief interest lies in the fact that gonorrheal invasion of these ducts is the most persistent lesion with which the gynecologist has to deal, for the gonococcus may remain indefinitely buried beneath the lining cells of the tubule and may cause a chain of symptoms referable to the urinary tract, as chronic urethritis, with its frequent and burning urination, or a persistant infective discharge, which in turn carries the infection higher up to the cervix. The diagnosis is made by exposing the mouth of the tubules, a finger in the vagina making pressure against the urethra from within outward along its course. A drop of pus may be expressed from the mouth of each tubule. The presence or absence of the gonococcus should always be demonstrated in the pus by the microscope.

Treatment.—After cocainizing the meatus and the urethra by inserting into the urethra a pledget of cotton wet with a ten per cent. cocaine solution, which is left in place for about ten minutes, a probe pointed hypodermic needle is inserted into the duct, and a drop of carbolic acid, or twenty-five per cent. silver nitrate solution, is injected into the tubule. This treatment may have to be repeated several times at intervals of a week. A more satisfactory method is splitting open the ducts with the electric cautery.

INFLAMMATION OF BARTHOLIN'S GLANDS

Bartholin's glands are two compound tubular glands situated one on each side of the posterior commissure of the vaginal orifice, their physiological function being that of lubrication. The infection is usually secondary to an infection elsewhere, especially in the urethra. They are rarely infected by any other organism than the gonococcus, so that an inflammation of them constitutes an almost unmistakable stigma of gonorrhea. The initial infection takes place in the short duct of the glands. The infection then extends to the main part of the glands, and an abscess is established which may become acute at once or lie dormant to light up at some later period. As a rule only one gland is affected, but both glands may become inflamed.

The clinical picture of an abscess of Bartholin's glands is characteristic. The patient complains of a vulvar swelling on one or both sides of the labia minora. There is exquisite pain and tenderness, which are rendered worse by friction or walking and are partially relieved by rest and with the thighs separated. On inspection, the usual evidences of inflammation, such as redness and swelling, are to be seen. The orifices of the duct or ducts are red and swollen, and there is an ovoid tumor in one or both labia, more or less occluding the orifice of the vagina. The overlying tissues of the labia are red, hot and painful, and the tumor rapidly enlarges, the enlargement extends backward toward the commissure and upward into the submucous tissues of the vagina. There is usually a slight elevation of the temperature.

Treatment.—This consists of complete excision of the gland. Simple incision, cauterization, and drainage rarely effect a permanent cure. At the present time I have a patient who refused excision of the gland, but was compelled to have an abscess incised three times, at six and eleven month intervals.

GONORRHEAL URETHRITIS

The picture of a well-defined gonorrheal urethritis is characteristic and almost pathognomonic. The vestibule is reddened and tender and bathed in pus. The meatus is pouting and swollen, while from the urethra can be expressed a thick creamy pus, a smear of which shows the gonococci.

The symptoms produced in a typical case in the female is quite similar in its initial symptoms to that in the male. There is first a sense of discomfort and then a burning from urination, followed by a purulent discharge. This pain on urination is sometimes extremely severe, and may be accompanied by ulceration and bleeding from the urethral mucous membrane. The duration of the average case is from three to six weeks, but the acute symptoms usually last only a few days. The disease has little tendency to ascend in the urinary tract unless carried by improper local treatment. Occasionally gonorrheal urethritis becomes chronic but when this happens there is usually an associated inflammation of Skene's glands, which has an influence in maintaining the persistence of the urethritis.

Treatment.—The local treatment is best carried out by injecting silvol five to ten per cent. into the urethra, care being taken not to force the solution into the bladder. The patient should urinate just before the injection and should abstain from urinating for at least an hour afterward. The solution used should be of such strength as the patient can tolerate without pain. Alcohol must be avoided. An abundance of water should be drunk. To guard against cystitis, five grains of hexamethylenamine or ten grains of helmitol may be given. No douching should be employed. The vulva should be cleansed every three hours with warm boric acid solution.

VULVOVAGINITIS IN CHILDREN

Primary gonorrheal infection of the vulva and vagina is a disease which affects children or young girls almost exclusively. This is due to the fact that the modified squamous epithelium of the vulva and vagina in children and early youth is soft and delicate. It is extraordinarily susceptible to gonorrheal infection. As the child develops into adult life the surface epithelium of the vulva and vagina becomes somewhat cornified and more resistant, so that in adult life a primary infection of the vulva or vagina is rare.

The mode of infection of vulvovaginitis in children is often difficult to determine. A few cases can be traced to depraved sexual practices. The children of gonorrheal parents are exposed to infection by contaminated towels, sponges and bed linen. The lochial discharge of a puerperal woman in whom childbirth

has lighted up a latent gonorrhea is a frequent means of infecting the child. Such sources of infection as these just enumerated are sufficiently obvious, but when gonorrhea makes its appearance and extends from child to child in carefully regulated institutions, such as hospitals and schools, the mode of infection is often puzzling and difficult to trace.

The clinical picture of a child with gonorrheal vulvovaginitis shows much swelling and redness of the external genitals, associated with pains and extreme tenderness. The parts are continually bathed with a profuse discharge of pus. The disease, like all forms of gonorrhea, is apt to last for weeks and months, if not promptly treated at its onset. The disease has little tendency to ascend above the vagina into the uterus and tubes, but much damage may be done in the vagina as a result of the tendency to ulceration of the vaginal membrane with consequent plastic adhesions between opposing surfaces. Various complications may arise. The urethra is infected, the cervix may become involved, less frequently cystitis, inguinal adenitis, bartholinitis, condylomata acuminata, arthritis, ophthalmia, and proctitis. General peritonitis is occasionally seen, rarely the result of upward extension through the uterus and tubes, more commonly the outcome of a gonorrheal septicemia (Norris).

Gonorrheal peritonitis is peculiarly favorable in its prognosis, and if a diagnosis can be made, should be treated conservatively.

Treatment.—The treatment of gonorrheal vulvovaginitis in children is difficult and requires great care and patience. During the acute stage there is often so much pain and tenderness that it is impossible to do more than keep the external genitals clean. When the more acute pain has subsided somewhat, a five to ten per cent. solution of silvol may be injected into the vagina and cleansing douches be given. A one per cent. mercurochrome ointment has given good results. If this can be done in conjunction with rest and strict cleanliness the disease can usually be quickly controlled, though it may be long before it is completely cured. It is needless to say that most of these cases are badly neglected if they do not receive hospital treatment.

VULVOVAGINITIS IN ADULTS

In the adult gonorrhea of the vagina is usually secondary to an infection beginning elsewhere. In the acute gonorrheal form a history of a suspicious intercourse is always suggestive; the discharge is profuse and of purulent character, yellowish or greenish in appearance. The urethra and the urethral glands are usually involved, so that frequent and burning urination is the rule. Fresh pus may be expressed from the ducts of Skene's and Bartholin's glands. The vaginal mucosal membrane is dark red or bluish in color, is more or less thickened and studded with patches of erosion which bleed easily.

The patient will complain of a throbbing sensation in the perineum, backache, and a feeling of heat and pain in the vagina. No positive diagnosis should be made unless the gonococcus can be demonstrated microscopically.

Treatment.—Rest in bed and a posture (Fowler position) that is comfortable to the patient and insures free vaginal drainage; no douches or irrigation should be given in the early stages. A twenty-five per cent. solution of silvol may be poured into the vagina. When the acute stage has been passed, douches may be given, and topical applications of silvol and similar remedies. Dibromin one to ten thousand as a douche has given good results.

GONORRHEAL ENDOCERVICITIS

The vaginal portion of the cervix at the external os is a common seat of gonorrheal infection in married women, for if the introitus is relaxed, the cervix becomes the first point of contact and is frequently directly infected at coitus. According to Menge, cervix infection is found in about eighty per cent. of all acute cases, and in ninety-five per cent. of chronic cases.

When the cervix is infected in the acute stage, there is a profuse mucopurulent discharge which fills the upper part of the vagina, the cervix is swollen and tender to the touch, and as a result of the hyperemia and swelling of the mucosa of the canal, the mucosa tends to evert and project itself beyond the external os. Menstruation may be irregular, painful and profuse.

Treatment.—In the acute stage the treatment is the same as in acute vaginitis. Later after the acute symptoms have subsided a twenty-five per cent. silvol solution is useful, and vaginal irrigations of bland antiseptic solutions may be used.

CHRONIC ENDOCERVICITIS

Chronic endocervicitis is the most prevalent of all gynecological disorders. There is a persistent irritating leucorrheal discharge which the patient has difficulty in controlling, even with numerous douches. Douches have no curative effect on the disease, as they do not reach the seat of infection, they merely cleanse the vagina. The influence of this constant leucorrheal discharge often has a disastrous effect on the nervous system of the patient, especially if she is aware of the original cause of her trouble.

In some of the glands the inflammatory process may cause a closure of the duct. The gland continuing to secrete without an outlet becomes a retention cyst. The endocervix is a favorite and treacherous place for the latent gonococcus to lurk, either in the folds of the lining membrane or in the ducts of the glands, ready to light up into later infectious activity under the hyperemic influence of coitus, menstruation or childbirth.

Treatment.—As mentioned before, douches serve only to keep the vagina clean. The treatment must be applied directly to the cervical canal. Whatever form of local treatment is instituted during the chronic stage, it is of the utmost importance, as a preliminary step, that the thick cervical mucus be removed. Its presence acts as a protective medium for the gonococcus, and prevents the application from reaching the diseased areas.

Tincture of iodine or ten per cent. silver nitrate solution applied to the diseased area and to the canal will at times effect a cure after repeated applications. Very good results are obtained from the linear cauterization, but this treatment may cause scars and interfere in future childbirth. In a few cases I have used radium with good results.

Corbus and O'Conor report very good results in the treatment of cervical gonorrhea by diathermy. B. C. Hirst, who has used this method of treatment,

is well pleased with the results thus far obtained. Before the heat is applied the endocervix should be thoroughly dried, and tincture of iodine or ten per cent. silver nitrate applied to the canal.

ACUTE GONORRHEAL ENDOMETRITIS

Involvement of the corporeal endometrium is invariably an extension upward of the cervical infection. The infection usually manifests itself shortly after a labor, an abortion, or just after a menstrual period, or the infection of the endometrium may occur during menstruation, for at these periods the open cervical canal favors the extension of the infection from below. There may be chills and fever, nausea and vomiting. The woman usually complains of pain over the lower abdomen, most marked over the region of the uterus, and some menstrual irregularity is frequently observed. The discharge is copious and thin but when it becomes mixed with the cervical discharge it becomes mucopurulent. The uterus is slightly enlarged, softened and tender, while the cervix which invariably participates when the body is infected, is hypertrophied and tender, and the cervical canal is more patulous than normal.

Treatment.—This is mainly expectant. The Fowler position will aid drainage, ice bags may be applied to the lower abdomen, and cleansing vaginal irrigation once or twice a day. The acute symptoms usually subside in about a week.

CHRONIC GONORRHEAL ENDOMETRITIS

This may occur as a sequel to an acute infection, or originate as a subacute process. When it does occur it is always associated with gonorrhea of the cervix, acute exacerbations frequently follow intrauterine applications or instrumentation, particularly when these manipulations occur near a menstrual period or after a miscarriage. The most constant symptom is leucorrhea, which is whitish or yellowish in color and thinner than that originating in the cervix. Menstrual disturbances are frequent.

Treatment.—The disease for the most part is treated in connection with chronic adnexal disease, with which it is usually associated. Curettage may be done with applications of tincture of iodine. The danger of lighting up the latent infection should be kept in mind.

GONORRHEA OF THE FALLOPIAN TUBES

Tubal gonorrhea is usually an extension of the infection from the uterine endometrium. The disease is usually bilateral, a different degree of pathology may exist in each tube; as, for example, one tube may be the seat of a suppurative salpingitis, while in the other the infection may have terminated in a pyosalpinx.

ACUTE GONORRHEAL SALPINGITIS

All cases of gonorrheal salpingitis are accompanied by a greater or less degree of pelvic peritonitis. The subjective symptoms are fever, pelvic pain, leucorrhea, and a bloody vaginal discharge. The pain and tenderness are diffused over the lower abdomen and are often severe. The pain is increased by muscular exertion, coughing or a jar. There is leucocytosis.

Bimanual examination shows a fixed uterus, excessive pain on touching either vaginal vault, early in the attack a mass is rarely palpable. The abdominal end of the tube is still open and the tube is moderate in size, and the excessive tenderness prevents any deep examination. Owing to the tendency of the inflamed tube to fall into Douglas's pouch, rectal tenesmus is frequently complained of. As the severity of the acute symptoms subside, it may be possible to recognize on bimanual palpation an inflammatory mass in the region of the appendages.

Treatment.—Acute gonorrheal salpingitis is rarely fatal, the disease usually subsides in one or two weeks. The treatment, therefore, is expectant. Rest in bed, liquid diet, hot vaginal douches two or three times daily, ice bag to lower abdomen and the bowels kept open. Operation should not be performed until the temperature has been normal for at least one week. If there is a bulging mass in Douglas's pouch vaginal puncture is the proper procedure, otherwise abdominal section is necessary. Surgery is indicated when a tubal mass is palpable or when palliative treatment has failed to give relief.

CHRONIC PELVIC INFLAMMATION

There is a history of leucorrheal discharge, usually of long standing; repeated attacks of sharp pain, recurring at intervals; there is a constant dragging pain in the lower abdomen, which is increased by the premenstrual congestion, and is relieved by the flow, and returning when the flow ceases. Disturbances of menstruation are common. Pain is increased by any muscular exertion, coitus or defecation. Pain is often referred to distant regions, as headache, backache, etc. These patients are usually neurotic, have digestive disturbances and chronic constipation. Most women with this disease are sterile.

Abdominal palpation shows marked tenderness on deep pressure over the lower abdomen, on bimanual examination the uterus will be found fixed and immovable; there is a hard, irregular, sensitive mass behind the uterus, or to either side of it. Pressure on the tubes always causes severe pain. The cervix is usually eroded and there is profuse leucorrhea.

Treatment.—Where a large tubal mass is palpable and in cases with great pain unrelieved by treatment, operative treatment is indicated. It is impossible, before operation, to judge how much must be removed. I have often been confronted with the problem, especially in young women, as to the advisability of removing both tubes. It has been my experience, that when at the request of the patient, who desires children, and was satisfied to take the risk of a second operation and the tube was the seat of even a slight gonorrheal infection, if such a tube is not removed it will usually cause trouble. The probability of pregnancy is remote, and if it does take place it may be an extrauterine pregnancy. As a rule both tubes are hopelessly involved, and frequently a tuboovarian abscess is formed, and the resulting adhesions require a radical operation.

OPHTHALMIA NEONATORUM

Through education of the physician and the people in general, ophthalmia neonatorum has been greatly reduced. Patients frequently request that the babies' eyes should be given prophylactic treatment. I believe that with continued effort on our part, and persistent demands that both the man and woman be thoroughly examined before marriage and that boys and girls be taught the grave danger of this plague, gonorrhea may be retarded in its ravages.

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Inflammatory Disease of the Cervix Uteri

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Admittedly it is extremely difficult or almost impossible to bring to light a new truth in the pathology, diagnosis and treatment of such an old, long recognized entity as inflammatory disease of the uterine cervix. But the progress of preventive medicine has made necessary the frequent résumé of accepted opinions and the restatement of proved conceptions concerning a disease which is perhaps the most common of all to which the female sex is exposed.

A study of more than three thousand consecutive cases examined in the Gynecological Department of the Cornell University Medical College Clinic showed the incidence of cervical disease, either as an entity or as associated pathological condition, to be more than sixty-four per cent.

In infancy and childhood it may be associated with the common vaginitis concerning the pathology and sequelæ of which we know so little. It is so prevalent during puberty that a moderate amount of leucorrheal discharge is looked upon by many as a normal prerequisite to proper sexual development. Married women during childbearing life, because of trauma, infection and other reasons incidental to pregnancy and its possibilities, show the highest frequency. But virtuous spinsters are not exempt and present types of the disease that are often most difficult to cure. And again in old age, atrophic cervicitis is not an uncommon nor an unimportant condition.

The etiology of cervical disease is most commonly bacterial invasion of its cellular structure, from a point lower in the genital tract. Except in the case of specific inflammation, however, there are predisposing factors which play important rôles in the incidence of the disease. Chronic hyperemia, the usual precursor of active inflammation, may be due to many causes, such as uterine malposition, excessive sexual stimulation, constipation, constitutional diseases such as anemia and obesity, and occupational conditions which necessitate prolonged standing and walking. The physiologically increased function coincident with pregnancy and its termination, the vascular changes, pressure, stretching and tearing, constitute the most common etiological factors.

Tuberculous inflammation of the cervix, according to Frank, constitutes about eight per cent. of all genital tuberculosis; primary tuberculosis is rare indeed. Most commonly appearing in the form of yellow-gray undermined ulcers about the external os, the diagnosis is confirmed by the evidence of the disease elsewhere, section examination of the ulcer tissue, and the identification of the tubercle bacillus.

Syphilitic inflammation of the cervix may show lesions of any stage, in the form of chancre, macule, patch, ulcer or gumma. The diagnosis of primary and secondary lesions is confirmed by demonstrating the presence of Spirochetæ pallidæ in dark field examination and the Wassermann test is of the greatest value in the secondary and tertiary forms. These specific diseases, however, are comparatively rare and offer little in the way of local treatment.

The relative frequency of gonorrheal infection is indeed hard to determine. Clinically and objectively the nature and course of chronic gonorrheal disease of the cervix is similar to that caused by other organisms and the diagnosis of such can be said to be authentic only when the presence of the diplococcus of Neisser can be identified in the discharge or in the cervical tissue itself. In the light of our presentday knowledge it is apparent that the prevalence of gonorrheal cervicitis has been overestimated and it seems fair to assert that the larger percentage of cervical infections is not gonorrheal, but more commonly due to organisms that inhabit the vagina normally, the staphylococcus, bacterium coli, and others; and of course it is easy for the streptococcus to gain access to the cervical cells. The treatment of gonorrheal cervicitis, except in its acute stage, is the same as advocated for cervical disease of other origin. In the acute stage proper treatment is rest, topical application of bland germicidal agents and frequent use of mildly astringent antiseptic douches.

It is the most common form of cervical inflammation, the ordinary eroded, hyperemic, cystic, hypertrophied type usually designated by the term endocervicitis, which is the chief interest of this paper. It seems at times difficult to demonstrate an absolutely healthy cervix in a woman subjected to careful gynecological examination. In nulliparous women a common finding is a normal appearing cervix with history and signs of a most profuse secretion of thick, viscid, mucinous discharge which is often most difficult to eradicate. Here we have a chronically hyperemic endocervix with the attendant hyperfunction of the cervical glands. Yet even in these apparently noninfective types it is fair to assume that some of the low grade organisms or floræ that inhabit the vagina have already gained access to the tubules of the Nabothian glands.

The cervix of the woman who has borne children is, however, the one most subject to serious disease. Even in easy normal labor, the cervix is traumatized more than any other part of the genital tract. The enormous amount of pressure and the degree of tension put upon its structure, must necessarily cause solution of continuity of some of its component parts, extravasation of blood, necrosis and replacement fibrosis of a more or less influential amount. To Sturmdorf we owe a great deal for having emphasized the relative unimportance of the laceration and the paramount significance of the superimposed infection. Fairly it can be said that laceration of the cervix of itself does not produce symptoms except the immediate ones, such as hemorrhage or shock, dependent upon its location and extent. During the stage of healing, however, due to many incidental circumstances, bacterial invasion is easy and likely. Throughout the postpartum period of involution the process of cervical repair is slow, the circulation is retarded, the mucosa is macerated and eroded, and the cell resistance to infection is lowered.

When one considers that the normal vagina is not sterile, it is not difficult to appreciate the ease with which the normal bactericidal power of the lower genital canal may be overcome and opposition be converted into invitation to active bacterial culture. Yet it is hard to isolate and identify the specific organism, due to the likelihood of mixed infection.

Pathologically the changes are most varied. In the mild form we have a chronically hyperemic cervix with glandular hyperplasia, exudation, hypersecretion, without infection. This type is usually found in the unmarried nulliparous woman; is often associated with malposition of the uterus and the discharge is viscid, glairy, and mucinoid. In the most severe form we find vascular changes, leucocytic and lymphocytic infiltration, edema, stroma reaction, glandular hyperplasia and general structural hypertrophy. The discharge is white or yellow, mucopurulent, with or without odor. Grossly the cervix is congested, intensely reddened or even cyanotic; the enlargement is apparent, the edema suggested by the evident glistening tensity of the mucous membrane. It is likely to be of varied color, spotted here and there with blue, yellow or white; irregular in consistency, hard and soft with excrescences apparent denoting retention cysts of the glands of Naboth in various stages of infection and degeneration. Varicosities may stud the surface. The size of the cervix may exceed that of the fundus, the enlargement being most marked in the vaginal portion.

But we must bear in mind that in the advanced stage of cervical inflammation we find a true cellulitis of all the structure, which spreads by contiguity of tissue, lymphatic extension and blood stream transportation. As a focal infection its importance must be recognized; its relation to arthritic and neuritic conditions has been frequently demonstrated. The portal of entry that a bad cervix offers to serious infection of the urinary system, pyelitis and pyelonephritis, is evident. It seems likely that extension to the tubes and ovaries is easy and often rapid. The adnexal pathology may be in the nature of a peritubal or periovarian inflammation or may easily become a suppurative salpingitis or oophoritis. It is not uncommon in the treatment of cervical disease to observe the rapid progress of the inflammation through the muscle tissue of the uterus itself, through the parametrium, finally localizing in a tube or ovary. And it is not uncommon to observe the spontaneous cure of such adnexal disease, aided by conservative palliative treatment.

Needless to say the most common symptom of cervical inflammation is leucorrhea. Then come in variable order dysmenorrhea, backache, bearing down pain in the lower abdomen, feeling of heaviness in the pubic region, headache. Menorrhagia or even metrorrhagia may be present. Sterility is a frequent complaint and the rôle played by cervical disease in its causation is evidenced by the frequency with which conception follows the cure of cervicitis.

The diagnosis is made by inspection, palpation and bacteriological examination. The appearance of the cervix is pathognomonic yet it is characteristic of cervical inflammation that even in cases where subjective pain is not present, careful examination will elicit the fact that even slight pressure upon, or movement of, the cervix is attended with pain of varying degree. In advanced disease, the cervix becomes fixed by the inflammatory exudate and induration extending into the parametrial tissue in all directions. The uterosacral ligaments become painfully rigid and backache from the lymphangitis here present is often of the most severe intensity. This fixity of the pelvic basin often responds quickly to proper treatment, with establishment of complete resolution in the structural anatomy involved. In the lateral fornices the indefinite tender thickening in the broad ligaments may occasion the diagnosis of salpingitis. The progressive course of cervical disease brings about tubal and ovarian involvement with the consequent organic and functional destruction.

The knowledge of the course and liability of cervical disease demands more care, first in its prevention and secondly in its eradication by proper therapeutics. It is probable that in the proper prophylaxis and treatment of inflammatory disease of the uterine cervix we have the greatest ability to lessen the incidence of cervical cancer. Our great duty is consistent with the opportunity for prevention. The care of the postpregnant woman has not received the attention that it has deserved. Postpartum examination and treatment should properly extend over a period of at least six months. It is not infrequent that a uterus that is apparently involuting well in good position at the end of one month, is large, boggy, subinvoluted and in extreme retroposition at the end of the third month. Lynch has estimated the prevalence of postpartum retroversion of the uterus at more than forty-one per cent. The best single prophylactic measure is the routine insertion at about the end of the fourth week, of a proper retroversion pessary which should be worn for at least two months. It must be borne in mind that involution is a physiological process that applies properly to all the reproductive anatomical structure; and any means that can be employed to hasten that reconstructive completion is to be greatly desired. Systemic hygiene enhances all local treatment. Many a well performed suspension operation is jeopardized by improper handling of a subsequent pregnancy. The physiological and functional hypertrophy of all the supporting structures that are an integral part of the phenomenon of uterine pregnancy may assure the permanency of an operative technic that otherwise might be transient. This is made possible by treatment essential to properly progressive involution and restored tonicity of the uterine supporting structures. Proper support assures better circulation, prevents strain and stretching. It not infrequently happens that a movable retroversion of the uterus is spontaneously cured by pregnancy and proper aftercare. Postural treatment, exercise, laxative diet, and local treatment are of value.

Successful treatment of cervical inflammation demands a thorough appreciation of the etiological and contributing factors in each individual case. General measures directed toward constitutional improvement are imperative. Locally the remedies used are legion. It will suffice here to mention briefly a few. Topical applications such as silver nitrate ten to fifty per cent., tincture of iodine, argyrol, mercurochrome, acriflavine are all useful in certain stages and types of cervical disease. Scarification, tamponing, astringent douches are of value. Intermit-

tent suction hyperemia and aspiration may be employed to advantage. The application of caustic potash as advocated by Strobell has undoubtedly effected many cures. Diathermy, endothermy and fulguration have their indications. Lactic acid and Bulgarian bacillus cultures are credited with beneficial effect. Radium, sponsored by Curtis, is drastic, not without decided risk, especially in regard to menstruation and subsequent pregnancy.

However, the agent par excellence in local treatment is the electrocautery. Actual cauterization of the cervix is probably one of the oldest therapeutic measures recorded. Hunner and Dickinson have more recently endorsed its value. Though technic may differ the underlying principle is the same; drainage of infective foci, destruction of bacteria, diminution of glandular cell hyperplasia and the consequent decrease in secretory matter. Multiple puncture with a fine electrode at red heat, to a depth of one half inch or more of the cystic follicles about the external os, with dilatation of the cervical canal and careful cauterization of the endocervical mucosa up to the region of the internal os, can be done in such a manner as to allow of marked regeneration of squamous epithelium and stroma cells from islets here and there. The glandular hyperplasia is obliterated, squamous cells replacing the glandular epithelium. There is a minimum destruction of muscle or fibrous tissue cells, with lessened stroma reaction and diminished vascularity. It has been found beneficial to apply to the cauterized area a solution of iodine in mineral oil. This has the germicidal action of the iodine without any evident irritation of the vaginal mucosa, and the oil exerts a soothing influence on the burned tissue. Cauterization may be done at intervals of seven to ten days with daily hot douching of bicarbonate of soda solution. The discharge after cautery application is extremely acid and prone to cause a dermatitis about the vulva that is best prevented by the alkaline douche.

Ordinarily no anesthesia is required, but in nervous women or women with sensitive cervices, infiltration with one per cent. novocaine, of each broad ligament at its cervical insertion, will afford complete analgesia. The course is necessarily slow extending in most cases over a period of several weeks, but the improvement is usually immediate and progresses often to complete cure. Atresia and stenosis of the cervical canal, conditions which are not infrequent sequelæ of the gross cautery under general anesthesia, with large electrodes occasioning destruction of considerable tissue *en masse,* and subsequent cicatrization, do not occur. Proper cauterization will restore a diseased cervix to its normal healthy condition.

Logically, the ideal indication for active cauterization is found when the cervical disease is *per se* the dominant pathological condition. If there exists bad laceration of the pelvic floor or of the cervix itself, malposition of the uterus, genital neoplasm or adnexal disease, then cauterization of the cervix is contraindicated, except in certain cases as a palliative, preoperative preparation.

Treatment of cervical disease by cauterization yields such brilliant results that it is seldom necessary to resort to surgical means. In fact it is fair to say that proper treatment by cautery gives better results than can be obtained by surgical technic, except where extensive laceration and dystocia exist.

The operation of choice is the operation that will, depending upon the age and condition of the patient, best remove the diseased tissue and conserve the function of the cervix. Schroeder's technic, modified to suit the severity of the individual case, offers the greatest expectation of permanent cure with minimum impairment of function. And this is so because in this method, one can split the cervix, outline the extent of involvement, remove as much or as little tissue as is necessary, and secure better approximation of endocervix and vaginal mucosa, and better hemostasis, than is possible with any other technic. Interrupted figure of eight sutures of chromic catgut are used throughout. Because of these facts, cicatrization, stenosis or atresia of the cervical canal, does not result.

In conclusion, it may be well to reiterate a plea for better care of the postpregnant woman; for better prophylaxis of cervical inflammation, the precursor of cervical cancer; to commend the conservative treatment of this disease and to discourage the mutilation of the cervix uteri by ruthless surgery.

The Rubin Test and Its Modifications in Female Sterility

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Sterility in the female still provides a fertile field for discussion, and offers unlimited opportunity for further progress, and yet it may be safely said that in this condition one of the outstanding advances in gynecology has been made. Excluding all those cases directly due to the male, and also those cases in the female with palpable pathological lesions of the adnexa, or other gross pathological changes evidently responsible for the sterility, there still remains a large group of cases to be accounted for. It is in this group that progress in more accurate diagnosis has taken place. A part of this group are those cases in which there is some endocrine disturbance as the basis of the sterility, another part may be the result of subfertility, due to faulty diet or other metabolic disturbance, leading to a state of relative sterility. The other cases in this group are due to occlusion of the lumen of the tubes, and have heretofore been unrecognized without resorting to operation. It is in detecting this group that the Rubin test has found its greatest applicability.

The test first introduced by Rubin in 1920 determines the patency of the tubes by the ability to pass gas through their lumina into the peritoneal cavity.

For this purpose the Rubin technic requires a tank of carbon dioxide gas with an attached pressure reducing gauge, to reduce the pressure of the gas as it comes from the tank; a flow volumeter to measure the quantity of gas introduced; a spring or mercury manometer to measure the pressure at which the gas is passed through the tubes; a Keyes Ultzman cannula specially prepared by boring extra holes near the end, and slipping a rubber urethral tip about 1.5 inches along the shaft to act as an obturator; the rubber tubing necessary to connect up these parts; a stop cock to control the flow of gas; a tenaculum and a bivalve speculum.

Furniss has modified this technic by filling a syringe with gas from the tank and injecting this through the cannula. I have further modified this procedure by doing away with the tank of carbon dioxide and its attachments, and substituting a Janet Frank syringe of 150 c.c. capacity, and injecting atmospheric air. The advantages of this modification are obvious. It eliminates the cumbersome tanks of gas, at the same time permitting accurate measurement of the amount of air introduced. There is no possibility of running short of gas during a test. The apparatus is portable and inexpensive to operate.

The technic used in performing the test is as follows. The patient is placed in the dorsal position. A bivalve speculum is introduced. The cervix and vault of the vagina are painted with tincture of iodine. The cannula is introduced into the cervical canal past the internal os, the rubber tip on the cannula pressing against the external os and acting as an obturator. The cannula is connected by rubber tubing and T tube to the manometer on the one arm and a Janet Frank syringe with the plunger drawn out to its fullest extent on the other. Air is gently introduced by pressure on the plunger. The pressure exerted is recorded on the manometer. Fifty c.c. of air are introduced. If the tubes are closed the pressure steadily rises and no air enters. This rise is permitted until a pressure of 220 mm. of mercury is reached. Above this it is dangerous to go, as rupture of the tubes and hemorrhage may occur. If the tubes are open the pressure at first rises anywhere from 60 to 120 mm. and then falls as soon as the initial resistance is overcome, and the air begins entering the peritoneal cavity. With the tubes partially obstructed the initial pressure may rise to 160 mm. or over before dropping and admitting air and then may fall only slightly.

There is no immediate reaction following the entrance of air into the peritoneal cavity. From five to fifteen minutes after assuming the upright position, the patient complains of pain usually in the right shoulder, less frequently in the left or both, and sometimes in the upper abdomen. The pain persists for from one half to twenty-four hours. X ray or fluoroscopy will reveal the layer of gas under the diaphragm. This is not essential for diagnosis, because if it is certain that there is no leak in the apparatus, there being no regurgitation past the cervix, and the manometer indicates a free flow of air, and subsequently the patient complains of the characteristic shoulder pains, the air must have entered the peritoneal cavity through the tubes. There is no other place for it to go.

In the event that no air flows at a pressure of 220 mm. maintained for several minutes, the test is considered negative and the closure of the tubes presumed. This is, however, not conclusive. The test should be repeated at one or two week intervals. No tubes should be regarded as absolutely occluded unless at least three tests have been made and all have proved negative. There are repeated instances in which the test has been negative on the first trial, and on subsequent examination has become positive. These cases are usually due to a temporary kinking of the tubes or plugging by inspissated mucus or slight exudate or swelling of the mucosa, or velamentous adhesions closing the fimbriated extremity, which conditions are overcome by the air introduced under pressure.

No ill effects have been observed following the test. Air embolism has not occurred, nor has there been any infection as the result of the test. The test of course should not be performed in the presence of a purulent cervical discharge, nor when the tubes are distinctly enlarged. It is best not to test tubal patency just before or following menstruation nor when there is an undiagnosed period of amenorrhoea present.

The test undoubtedly finds its greatest applicability in the diagnosis of tubal patency in sterility. There are however a number of other conditions in which it may be used to advantage. One of these is the production of pneumoperitoneum for pelvic and abdominal x ray diagnosis. In this procedure about one thousand cc. of oxygen or carbon dioxide are used, followed by immediate x ray examination. Another use for the test is for the determination of subsequent patency of the tubes after a salpingostomy has been performed, as well as to maintain the patency of the artificially opened tubes. Still another indication for the test is in the determination of the success and permanency of artificial sterilization when this is done by the resection of a portion of the tubes. The test may serve further to determine whether, in some cases following myomectomy done with a thought to possible future pregnancy, the uterine ostium of the tubes has been occluded by the suture of the bed of the fibroid following its removal. A further interpretation of the information derived from the test, though in the nature of a deduction, is yet of the greatest importance. The test determines patency of the genital tract beyond all question, and when once established, stenosis in any part of the tract can be excluded as a cause of sterility. This consequently contraindicates any operation or other manipulation for the purpose of straightening the uterine canal, or dilatation to overcome the supposed stenosis.

The results obtained from the use of this test in sterility have been enlightening and highly instructive. From an analysis of my own cases and those reported in the literature, it appears that in about thirty-three per cent. of cases sterility is due to closure of the tubes. Many of the cases negative at the first examination subsequently became positive. Several subjects became pregnant following the establishment of patency. It is not advisable, however, to attempt to use the test as a therapeutic measure to establish patency in closed tubes. That there was so large a percentage of cases due to nonpatent tubes,

seems to show that many of these have heretofore been attributed to other causes. In the light of our present knowledge it is imperative that no therapeutic procedure shall be instituted in the treatment of female sterility, until postcoital examinations for spermatozoa from specimens taken from the vaginal, cervical, and uterine secretions have been made, and a transuterine insufflation of the tubes to determine their patency has been performed.

151 West Seventy-seventh Street.

Pregnancy With Complications

Hyperemesis Gravidarum; Varicose Veins; Hemorrhoids; Left Inguinal Hernia; Threatened Eclampsia; Occiput Posterior Position; Podalic Version

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Case.—The patient, a tertiagravida, para 4, aged twenty-nine, consulted me in the third month of pregnancy for pernicious vomiting. Her history revealed numerous attacks of sore throat and arthritis, tonsillectomy, appendectomy, and three easy deliveries of well developed babies. The last period had commenced on February 16, 1923. Physical examination showed a left inguinal hernia, varicose veins, hemorrhoids and a three months' pregnancy. She was treated, as usual, with ovarian extract three grains intravenously daily for four days and five three times a day by mouth for a month, with three grams of sodium bromide by rectum every four hours and rest in bed.

The vomiting was quickly checked, and she continued without complaint until the sixth month. At this time she had a uterus the size of a nine months' pregnancy and was afflicted with spots in front of the eyes and a queer loss of sensation over one side of the body with dizziness. The blood pressure was 130/90 and the urine contained only a faint trace of albumin with no casts. Rigid diet was prescribed, together with rest and chloral hydrate. The blood pressure dropped to 100/60. Two weeks later she complained of pains in the throat and muscles, which indicated an infection of some sort, though no fever was present. Calcium lactate in one gram doses was given three times a day over a period of one week. Her spells of weakness and dizziness and numbness continued for approximately six weeks, when she was able to be a little more active with greater comfort. During this time the stomach gave much trouble and constipation was quite marked. The uterus apparently did not increase much in size during the last six weeks of pregnancy. On November 16, 1924, at 2 a. m., severe pains started and at 5 a. m. there was three fingers dilatation. At 6:30 a. m. examination showed that dilatation was complete but the head was caught transverse in the pelvis, occiput slightly posterior, wedged tightly against the symphysis so that progress was delayed. Forceps were attempted but because of the insufficient space to place the blades in the axis of the child's head version was performed. Both mother and child recuperated satisfactorily.

Vomiting of pregnancy is considered to be the reresult of ovarian insufficiency and hyperirritability of the nervous system. The administration of ovarian extract alone is frequently sufficient to check the vomiting. When emesis becomes pernicious, depressants are adjuvants. When acidosis is present, the intravenous administration of glucose solution with possibly a small dose of insulin in addition to the foregoing will give the most prompt relief. This patient had vomited all food for four days and all fluids for two days when first seen.

Varicose veins should be treated expectantly until after delivery when, if necessary, they may be treated surgically. They frequently disappear after the abdominal tumor has been relieved.

The hemorrhoids were increasingly troublesome during gestation and continued somewhat so after delivery. As with the varicose veins of the legs they are best operated upon after delivery.

Hernia with pregnancy unless of unusually severe nature or unless the patient lives in an isolated place where ready medical aid is not at hand, does not require surgical repair until after delivery. In this case, the hernia was more noticeable during the last trimester but caused no trouble during delivery.

The dizziness and numbness were undoubtedly due to the presence of infection in the body. This patient had had frequent attacks of arthritis previously. The large size of the uterus with its interference to elimination and digestion and pressure on the liver predisposes to eclampsia. In the presence of infection this state becomes almost a certainty. The treatment of infection with forced catharsis and rest aids in averting such a danger.

In this patient it might be questioned whether the symptoms were due to a threatened eclamptic state. The hernia might probably have given the same picture. No case has been reported, apparently, of hyperemesis gravidarum and eclampsia or threatened eclampsia occurring in the same patient. The underlying pathology is reputed to be at variance. But in this case, the presence of the very large uterus, the symptoms of slight kidney injury make the brain disturbance appear preeclamptic.

The position of the head was practically that of occipital posterior, and the force of the pressure against the symphysis caused extreme pain in the urethra. This pain is characteristic when the progress of labor is delayed at this point. The head was wedged tightly against the symphysis in front and the sacrum in back and pushing the head up and applying forceps did not facilitate matters. A version was the simplest procedure under the circumstances.

301 Donaldson Building.

Historical Medicine

The Early Years of the New York Post-Graduate Medical School and Hospital*

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New York

In order to have a clear conception of the conditions underlying any social movement, it is necessary to study the background existing before and during such a movement. With this in mind, a brief glance at the status of medical education at the time the Post-Graduate Medical School was founded may be of interest.

Medical teaching was then carried on exclusively by schools of low or mediocre standing grouped principally in the larger cities of the country. These institutions were practically proprietary schools although a few had university connections that, however, were only nominal. No preliminary examination for entrance was required and the same lectures, comprising the various branches of medicine, were repeated each term and after two years thus spent the student could come up for examination for the M.D. degree. This conferred the license to practise medicine, and, although clinics were held, attendance was not compulsory; it was hence quite possible for a student to be authorized to begin the practice of medicine without ever having seen a sick person. This deplorable state of affairs was remedied not by inauguration of the medical colleges but by outside influences. I believe the action of the State Board of Health of Illinois in requiring a state license to practise medicine was one of the earliest factors in raising the standard of medical education in this country. Other states gradually followed so that soon a state examination was everywhere required before allowing a candidate to practise medicine. This naturally caused the colleges to raise their standards as the degree of doctor of medicine which was conferred by them was no longer a license to practise as heretofore.

DR. D. B. ST. JOHN ROOSA

At the time the Post-Graduate Medical School was founded short courses and insufficient clinical instruction thus characterized the operation of the undergraduate schools. If these courses were defective even in training beginners, what shall be said of inviting graduate physicians to sit on the benches to try and brush up by attending clinics intended only for undergraduates? Yet this was all the great city of New York, with its enormous wealth of clinical material, had to offer physicians who wished to keep up to date in medicine or to pursue advanced studies.

At this time a man of strong character and broad vision, Dr. D. B. St. John Roosa, resolved to remedy the condition. He was then a clinical professor at the Medical School of New York University. With some of his colleagues in the faculty, he requested the university authorities to form a postgraduate faculty that would specialize in advanced instruction and demonstration adapted for physicians only. This was refused and as a result Dr. Roosa, Dr. W. A. Hammond, Dr. J. L. Little, Dr. Piffard, Dr. Pallen and Dr. Sturgis resigned from the Faculty.

After some further agitation and discussion it was resolved to hold a large public meeting to consider the possibility of starting a new college to be devoted exclusively to postgraduate instruction. This meeting was held in the summer of 1882 at Chickering Hall, a large auditorium then situated on lower Fifth Avenue. Several enthusiastic speeches were made by prominent physicians and laymen and the new enterprise was launched.

The first clinic was held by Dr. Little on November 6, 1882, in the lecture room of the College of Pharmacy, then located on Twenty-third Street east of Third Avenue. This building continued to be used for teaching, while the ground floor of a tenement house next door was utilized for dispensary purposes. The critics of the undertaking took pleasure at this time in speaking of the medical school in a tenement house.

In 1883, a large building on Twentieth Street, formerly used as an old ladies' home was purchased and the institution moved to that location. The purchase was effected by bonds furnished by the Faculty toward payment. The bonds were later turned in by the holders and publicly burned.

The building was at first used only for teaching and housing the dispensary. A little later, in 1884, a few private rooms in the building were rented by some members of the Faculty for the use of their patients and this really constituted the beginning of the hospital. The appliances were crude and the food was furnished by a Third Avenue restaurant. In 1885 a hospital association was formed independent of the school which continued for about a year.

*Address delivered at the opening of the McKernan addition to the Post-Graduate Hospital, January 22, 1925.

Fig. 1.—First hospital; formerly an old ladies' home.

A little later this association was abolished and the school and hospital were amalgamated.

It was hard work to finance and operate the school and hospital but Dr. Roosa was loyally supported by the Faculty. Dr. Clarence Rice and Dr. Samuel Lloyd were especially active in working for the support of the school at this time.

As students came in large numbers from all parts of the country to take the courses, it soon became evident that this plant was inadequate to be transformed into a large teaching hospital. Another great effort was accordingly made and in 1889 the plot on the corner of Second Avenue and Twentieth Street was purchased. Construction was started—largely on faith—but soon a great misfortune was literally unearthed. In digging the foundation an underground stream was brought to light that required a very large sum to properly deflect. The contractor failed and the work was held up indefinitely with unpaid bills pouring in on the directors.

At this time, when the outlook was darkest, the ladies committee of the babies' wards under the leadership of Miss Ella Russell began to raise money as their share in the expense of building and equipping the wards in the new building. Some generous sums were thus contributed at this critical time and construction was resumed. It is doubtful if the undertaking would have survived without this timely aid.

Fig. 2.—The hospital at Second Avenue and Twentieth Street.

The new building when completed represented at the time a modern hospital equipment well suited to caring for the sick as well as for teaching physicians the newer advances in medicine.

On a pleasant day in June, 1891, a procession headed by Dr. Roosa and Dr. Lloyd marched from the old to the new building and took possession.

Thus ended and began a new era in postgraduate medical instruction. It is doubtful if there has ever been a more unselfish group of physicians than those who then labored without return of any kind to place the institution on a firm footing. There was a heavy debt on the property and second mortgage bonds were taken by these physicians and their friends to help out. At one time over $40,000.00 was subscribed by the Faculty to pay a floating indebtedness and even these bonds were afterwards all turned in. A few of our doctors were even willing to endorse notes, thus risking what little they possessed in order to meet the growing deficits and keep the enterprise growing. Thus the faith and sacrifices of a few devoted physicians were directly responsible for the inception and early continuance of an institution for the benefit of the medical profession and through them of the public at large.

The success attending the teaching was evidenced by the increasing numbers of students matriculating at the school. Although some mistakes in personnel were made, as in all institutions, there was a group of brilliant clinical teachers at this time rarely equalled and not surpassed anywhere in the country. Among these earlier teachers it is only necessary to recall such names as Dana, Abbe, Bache, Emmet, Bangs, the Hammonds, C. C. Lee, Satterthwaite, Hanks, Powell, Phelps, Phillips, Rice, Porter, Lloyd, Caillé, Einhorn, Willy Meyer, McPhee, McKernon, and others of like calibre. One can thus appreciate what was offered in the line of instruction at that time. The reputation then built by the teaching of these men has stood the institution in good stead until the present day. The demonstration that physicians need a particular type of instruction especially fitted to their needs and a different kind of teacher than is found in undergraduate institutions was early proved in this school.

In other ways the hospital forged ahead and took its place among the leading institutions of the country, quick to recognize and apply any advances in scientific or philanthropic effort. Two examples of this may suffice. Shortly after Roentgen's great discovery, Dr. Lloyd went to Europe to secure the necessary material and data. As a result, in 1895 the first x ray machine was installed in the hospital, antedating its use in other hospitals.

On the philanthropic side, hospital social service was started in the children's division of the hospital as early as 1890. As far as I know, this was the first actual and continuous operation of this beneficent work anywhere undertaken. It was based on

ne idea that in possibilities of service the hospital epresents one of the broadest human institutions. he treatment of disease, teaching and research ould all be combined in its operation. With refer- nce to the latter, not only the investigation of the uses and treatment of individual diseases but social isorders and maladjustments should likewise be onsidered. To attain its broadest usefulness, the ospital must serve as a sort of social laboratory which disease and distress should be traced to eir ultimate sources. Only thus can relief be made ermanent and recurrence of disease prevented.

Acting on this idea, an intensive study of the life onditions of 3700 sick children treated in the hos- ital was made, starting in 1900 and continuing rough a series of years. As the result of this udy the real underlying causes of these sicknesses ere explained along three broad lines—insufficient arnings, bad housing, and ignorance on the part of ne parents.

While these and other efforts were constantly be- g made, in addition to the routine of teaching, Dr. oosa and his colleagues were meeting numberless ifficulties and obstacles in guiding the development nd growth of the institution. The greatest source f anxiety was on the financial side. There was lso criticism and obstruction that were very trying o one who was wearing out his life on one of the ressing problems of the day—that of diffusing and idening the products of advanced medical education o as to reach the profession at large and at work.

Nothing could daunt the faith of Dr. Roosa in the uture of postgraduate medical instruction. In the arkest hours, when failure seemed imminent and navoidable, he never doubted that success would ventually come. He took the long view and had ide faith, high hope and abundant vision.

But years of anxiety and persistent toil finally old on him and the leader passed on. Often in the ffairs and struggles of life we delay our meed of raise too long. When tired hands are folded, we our into ears that cannot hear our appreciation of reat efforts and sacrifices. At least Dr. Roosa lived o see the foundations firm and the future hopeful. We can well apply to him those ringing lines of Kipling—

> And only the Master shall praise us, and only the Master shall blame,
> And no one shall work for money, and no one shall work for fame,
> But each for the joy of working, and each in his separate star,
> Shall draw the Thing as he sees it for the God of Things as they are.

So much for the past. What of the future? It s a far cry from the humble beginnings to the arge and complete plant that now houses the Med- cal School and Hospital, but I believe that post- raduate medical instruction will develop along still arger lines. New York with its vast cosmopolitan opulation should become the recognized medical cen- er not only of this country but of the world. Such ttainment will call for vision, courage and action— nd the leaders must lead.

It is true that the undergraduate colleges are now iving their students a broad training, although ome think the laboratory is being overstressed in

Fig. 3.—The hospital with large addition which was erected by the Hewett legacy.

comparison with wide clinical teaching and experience.

In the past few decades, however, scientific medicine has made greater advances than in the whole preceding period of history. There is every reason to believe that the coming years will present even greater discoveries and advances. How can the busy physician keep up with these rapid changes except by frequent visits to a great teaching hospital where every improvement in diagnosis and treatment can be demonstrated. Here lies the great future necessity of postgraduate medical instruction. The courses should be long and short to accommodate both the specialist and the general practitioner.

A university connection would greatly help in developing some of these courses and in training young men as teachers. It would offer a splendid field for such training as it must always be remembered that this school was founded primarily as a teaching institution and the hospital is to be utilized for demonstration. The early history of this school and

Fig. 4.—The hospital with the McKernan addition, taking in the Second Avenue block.

hospital developed some great and unselfish men who builded better than they knew. They form an inspiration for those who now and in the future carry on in this great work. As all give the best that is in them to build a great and lasting institution, we may well have faith that success will be assured.

At any rate, let us feel that we can apply to a these workers—past, present and to come, those fa miliar lines from Addison's *Cato:*

> 'Tis not in mortal to command success,
> But we'll do more, Sempronius,
> We'll deserve it.

51 West Fifty-first Street.

Contributors to the Science of Medicine

Vesalius, the Father of Anatomy

Until comparatively recent times little was known of Vesalius, the Father of Anatomy, the man who had the genius and patience to discover the facts of anatomy and the courage to force these facts on a medical profession permeated and held in thrall by the erroneous views of anatomy taught by Galen. Vesalius, inquisitive of the truth as all pioneers of genius are, was not content to accept the statements of Galen, but investigated from nature himself, and thereby revolutionized the knowledge of anatomy. According to Dr. James Moores Ball, of St. Louis, "The whole of anatomy is a study involving correct descriptions of the component parts of the body and accurate delineations thereof, may be said to have been founded by Andreas Vesalius and Jan Stephan van Calcar."

In the Renaissance which took place in Europe after a period of intellectual darkness lasting for almost ten centuries, medicine awoke from its lethargy and fell into step with the general advance of knowledge. Italy was the land in which this movement towards the light began. She took the torch from the Greeks and handed it on to the nations still sitting in the shadow of intellectual darkness. This revival of learning, be it understood, was from the seeds which had been planted during the Middle Ages but which had borne no fruit until the time had come for a seemingly "spontaneous outburst of intelligence." Intelligence had not been extinct but dormant. In every branch of human intellectual endeavor this outburst manifested itself—in art and sculpture, literature and philosophy, physics and geography, history and invention and in anatomy. Of course, some share in this revival must be ascribed to the recovery of the long lost writings and sculptures of ancient Greece and Rome. But it went deeper than this. It included all branches of learning.

In referring to the Renaissance and the discovery of anatomy, and the salient facts of its establishment on a sound basis, it may be pointed out that there was an alliance which was of reciprocal benefit between anatomists and great artists. Indeed in recent years more than one attempt has been made to show that it was not Vesalius, but Leonardo da Vinci that greatest genius of all ages, who was the founder of modern anatomy. It is true that if Leonardo's anatomical sketches had been published during his lifetime, they would have revolutionized anatomy. However, the conclusions of McMurrich in the *Medical Library and Historical Journal,* December, 190 quoted here, are an apt and fair presentation of th case. "Leonardo was the first to create a new ana omy, but he created it for himself alone; Vesaliu demonstrated a new anatomy to the world. It wa the publication of Vesalius's *Fabrica* that revolutio ized anatomy, while Leonardo's drawings were lyin unpublished, at first the cherished possessions of hi favorite pupil, Melzi, later in the Ambrosian Librar in Milan, and still later forgotten in the Roya Library at Windsor. We must credit Leonardo a being the forerunner of the new anatomy, but Vesa lius must be recognized as its founder."

In Italy during the Renaissance were the mos celebrated medical universities of the world. Th ancient universities of Padua, Bologna, Pavia, Pisa and Rome eclipsed the schools of Paris and Mont pelier, of Toulouse and Salamanca. The Italia cities were filled with students from foreign lands Padua had more than one thousand new student every year, salaries were paid to her one hundre professors, and medicine was looked upon as a nobl profession. It is worthy of notice that the anatomi cal knowledge of Galen, who up to the time of Vesa lius dominated the teaching of anatomy in the medi cal schools, was largely gained from the dissectio of the lower animals. Despite these limitations h possessed a remarkable familiarity with practica anatomy, while his knowledge of osteology was ex tensive. He made grave errors in some of his de ductions. When Salernum was the great medica school of the world, anatomy was taught from dis sections made on pigs.

Andreas Vesalius, or Wesalius, was born in Brus sels on December 31, 1514, doubtless of Flemish origin, as the name was adopted from Wesel o Vezel in the Duchy of Cleves, which his family claimed as their native place. Little is known o the youth of Vesalius. At an early age he was sen to the University of Louvain and it is said that when quite young he began the practical study of anatomy by dissecting the bodies of mice, moles, rats, dogs and cats. In 1933 the young Fleming went to Paris to obtain a medical education, as at that time Paris was the Mecca of the medical world, where Sylvius a hard and fast disciple of Galen, was a teacher of anatomy.

The teaching of anatomy in the early part of the

xteenth century was defective. There was too reat a blind belief in the views of Galen and theoriz-ng from his teaching, while of actual dissection little vas done. Even when a dissection was performed, comprised only a superficial study of the intestines nd abdominal muscles and the bones, veins, arteries, nd nerves were almost entirely passed over. It was ne lack of opportunity really to study anatomy vhich led Vesalius to endeavor to learn anatomy rom Nature. He dissected numerous dogs and ventually procured bones of executed criminals rom Montfançon where their bodies were deposited. Ie thus became a master of the osseous system. In 536 he returned to Louvain and late in this year r early in 1537 conducted the first public anatomy nat had been held in Louvain in eighteen years.

In 1837 Vesalius published his first book, *Parahrasis in nonum librum Rhazæ,* a free translation of he ninth book of the Almansorem of the celebrated Rhazes. In 1537 he first visited Italy. He went to Venice where the study of anatomy was not tabooed as was frequently the case at that period, rather it was encouraged. In Venice he met his countryman, Jan Stephan van Calcar, who was afterwards to collaborate with him in the production of his first anatomical plates.

ANDREAS VESALIUS

Vesalius, at about this time, settled in Padua, and on the sixth day of December, 1537, shortly after having received his degree as Doctor of Medicine, was appointed professor of surgery with the right to teach anatomy at the famous University of Padua. Soon after accepting the chair of anatomy in Padua, he articulated a human skeleton for use in his class room. He next prepared a set of anatomical plates. In 1542, after three years of most arduous work, Vesalius completed his marnum opus, the *Fabrica,* and twelve days later he wrote the last word of the *Epitome.* A fortune was spent upon the illustrations and publication of the great work. The first edition of the *Fabrica* is folio volume with magnificent illustrations on wood. It is not stated who drew the illustrations. They have been attributed to Titian. The great anatomist, however, speaks regretfully of the large sums which he was obliged to pay, in order to induce skilled artists to do this kind of work. When it is borne in mind that antiseptics and preserving fluids were not known, it is not surprising that great artists were averse to encountering the foul odors which emanated from cadavers which had been kept for some time. Dr. James Moores Ball concludes that the illustrations for the *Fabrica,* like the figures in the *Tabulæ Anatomicæ,* were made by Jan Stephan van Calcar, the favorite pupil of Titian. Van Calcar was a Fleming from the Duchy of Cleves.

The *Fabrica* is the rock on which the reputation of Vesalius firmly rests. It contains the rudiments of anthropology as well as the first illustrations of comparative anatomy. The first book is devoted to the bones and cartilages with which he deals, with a thoroughness and accuracy which both amazed and aroused the envy of his contemporaries. In it he corrected some errors made by Galen. The second book, which describes the ligaments and muscles, while hardly reaching the high standard of the first book, is superior to any work on the subject written before. The third book is given over to a description of the veins and arteries. This book is a great advance over previous works of a similar kind. Although he follows the traditional belief that the blood movement is a sort of flux and reflux in the veins, he overlooks the function of the venous valves, describing them as eminences or projections which in no way interfere with the flow of blood. The fourth book deals with the cerebral and spinal nerves, and the fifth with the organs of nutrition. The sixth book is taken up with an account of his views of the anatomy of the lungs and heart.

Vesalius knew that in various details the accepted physiology of the vascular system was wrong and he had more than an inkling of the truth. If he had lived a few years longer or if he had remained professor of anatomy in Padua instead of accepting the post of court physician to Charles II, it is likely that the circulation of the blood would have been discovered by him. That, however, was in the lap of the gods. Vesalius pointed the way, and Harvey, following the trail, made that epoch making discovery.

After the publication of the *Fabrica,* opposition to the views of Vesalius became increasingly bitter. Pioneers, or those who seek to upset long held views are invariably vigorously attacked by the conservative members of a profession who always greatly outnumber the searchers for and finders out of obscure problems. His old teacher in Paris, Sylvius, a hidebound follower of Galen, was one of the most prominent of his antagonists. The Padua Medical School itself was a very hotbed of opposition. It is said that weary of the seemingly hopeless task of convincing men of the truth, sick of futile arguments and disputations, Vesalius threw his manuscripts into the fire and bade a long farewell to science. It is while in this frame of mind that he accepted the post of court physician to Charles II of Spain, the greatest monarch of his time. Although Charles in 1555 abdicated in favor of his son Philip, Vesalius was retained as court physician.

In 1564 Vesalius left Madrid suddenly, after a stay of twenty years, during which time he had neglected science or rather perhaps because there was little opportunity to pursue its study. According to

one account, which in the opinion of Dr. Ball appears the most plausible, the reason that Vesalius left Madrid in such great haste, is told in a letter written January 1, 1565, to the physician Caspar Pencer by Herbert Languer, the Huguenot friend of Philip Sidney. This letter, after mentioning that Vesalius had died in Jerusalem, narrates why he went there. Believing a young Spanish nobleman whom he had attended to be dead, he obtained leave of the parents to open the body to attempt to find out the cause of death. This was granted, but he had no sooner made an incision than he perceived that life was not extinct. The parents coming to the knowledge of this were not satisfied with prosecuting him for murder, but denounced him to the Inquisition, hoping that he would be punished with greater rigor by the judges of that tribunal than by those of the common law. The King of Spain interposed, and saved him on condition that he should undertake a pilgrimage to the Holy Land. Whether this reason for going to Jerusalem is true or not—evidence is in favor of its truth—it is a fact that Vesalius returning from the Holy Land again to teach anatomy at Padua, was wrecked on the Island of Zakynthos, while crossing the Ionian Sea, where on October 15, 1564, he perished from exhaustion. The end was tragedy of the man who before he was thirty years old had revolutionized anatomy and is now recognized as the greatest anatomist who ever lived. Why the fame of Vesalius is not better known is largely because his writings were in Latin and were published before the sixteenth century.

This account of Vesalius is largely gathered from his life by Dr. James Moores Ball, of St. Louis.

Student Life at Glasgow University About Ninety Years Ago.—J. H. Alexander, M.B., C.M., writes (*Glasgow Medical Journal,* January, 1925) that most of the notes he has used as a basis for his article were narrated to him by his father, and are significant in showing how different was the curriculum in those days from what it is now. His father was William Alexander, M.D., born in 1815, the year of the battle of Waterloo. He received a pretty good basic education from the village schoolmaster, and made up his mind while still in school to become a doctor. In June, 1831, he entered the shop of a chemist of Kilmarnock, where he learned to make pills, powders, tinctures, etc., and how to read prescriptions and to dispense medicines. In November of the same year he entered as a student of medicine at the old University at Glasgow, and took up the study of anatomy, chemistry and surgery. In the chemistry class, among the subjects taught were electricity, galvanism, and steam. "The students were shown many experiments with galvanic batteries, and as to steam, the professor had a small locomotive, with a charcoal fire boiler, which was shown running to demonstrate the power of steam." William used to travel to and from Glasgow from Kilmarnock by stage coach, a journey requiring nearly three hours. In February, 1832, the epidemic of cholera which had been raging on the Continent appeared in Scotland. The first case in Glasgow lived in the apartment above William's. The patient was a man who died after a few hours' illness. William was not frightened and continued h studies.

Great precautions, or what were then considere such, were taken in all the towns and villages; n body was permitted to enter or depart if it we known that he or she had come from a cholera i fected district; thus the influence of carriers' spread ing the disease was recognized. By order of th magistrates, on the main roads leading into town and villages, were stationed men called "Buff-the Beggars" who were instructed not to allow any pe son to pass unless they were certain that he or sh had not come from a cholera infected district, an on no account to allow vagrants and beggars to pas at all; beggars were marched to the boundary of th borough, setting them on their way to Glasgow o elsewhere, and giving them a parting buff as the left; hence the name "Buff-the-Beggars." By Apri cholera was raging so fiercely that William's par ents wrote frequently begging him to come home but he refused. At last, however, he yielded to thei entreaties, and went, carrying with him a chemica retort and a couple of lancets. That summer he tool Sir William Hooker's botany classes, and the fol lowing session classes in anatomy, practical anatomy surgery, clinical surgery, materia medica, and mid wifery.

To supply the dissecting rooms in Glasgow, Edin burgh and Aberdeen, bodies recently buried were taken out of their graves by the socalled Resurrec tionists. Although the risk was great from possible discovery from watching relatives in the graveyard the price paid for the bodies was a high one and made the venture worth while in view of the grave robbers. The bodies of criminals who had under gone capital punishment were always sent to the anatomical rooms. It was not very difficult to get bodies, for capital punishment was visited on mur derers, sheep thieves, forgers, and coiners of base money. Sometimes experiments were made on the bodies of newly hanged persons. The body would be taken to the dissecting room almost the moment the hanging was completed, and the batteries applied, with often very uncanny results.

At that time all operations were performed without anesthetics, for chloroform and ether were unknown. Antiseptic dressings of wounds were also unknown. "The groans and cries of patients undergoing operations were pitiful to hear; the shock to the system was very great. Blood poisoning was a frequent ending to operations; secondary hemorrhage often took place, erysipelas and hospital gangrene would spread from one surgical case to another. Owing to the almost absolute fatality which followed them cranial and abdominal operations were prohibited."

The stethoscope invented by Laennec was seldom used; it was then a large, clumsy wooden affair regarded more as a toy than as a useful instrument. Sounding was performed by direct application of the ear to the patient's chest, with a towel between. In the fever wards were often cases of diphtheria, smallpox, typhus and scarlet fever. The professor received in his private room the class fees from students. As educational equipment the students had not much more than a blackboard and some chalk. There were almost no laboratories, and the microscope was not used in physiology or medicine. With

the exception of acquaintances in the classroom, there was little opportunity for contact with other students. William studied, except on Saturdays and Sundays, eight hours a day.

In 1834 he decided to present himself for the degree of Master in Surgery. There were then no written or practical examinations; only oral ones. William was examined at one and the same time on all the subjects he had studied. One of his questions was: "In what respects does lithotomy of the moderns differ from lithotomy of the ancients?" He was asked to translate some Latin at sight, from a book he had studied, however. When the examination was over and he was leaving the room, one of the examiners told him to wait. He was soon told that he had passed satisfactorily, and that in a few days he would receive his degree of M.C. William was nineteen years old when he received this degree.

During the next session he took courses to enable him to qualify for his degree of M.D. and studied in some of the Paris hospitals. In 1836 he presented himself at Glasgow University for his examination, which was a very severe one lasting nearly two hours, and including about 180 questions, the translation of three pages of Latin, and the writing of a short essay on diabetes. Both diplomas were given to him in tin boxes with enormous red wax seals several inches long.

Antique Microscopes.—The celebrated collection of antique microscopes, made by the late Sir Francis Crisp, was sold at auction on February 17th. Among the 371 lots in the catalogue, says the *British Medical Journal,* February 14, 1925, there are many of great interest for their historical associations, their excellence of workmanship, or the beauty of quaintness of their design. In the seventeenth and the first half of the eighteenth centuries microscopes were not the severely practical utilitarian instruments with which we are familiar. The craftsman was not content with having done his best to turn out an optically efficient instrument. He further lavished his time and skill in ornamenting every available part of the apparatus, whether the microscope were a tiny simple hand microscope, such as that made in Augsburg in 1686, or the elaborate compound microscope nearly two feet high, which furnishes the frontispiece of the catalogue. This microscope, which was made by Adams of Fleet Street about 1746, is of silver and most elaborately ornamented, so much so that, with its Corinthian column and allegorical figures, it looks more like a presentation centrepiece than a scientific instrument. There are several other interesting specimens by this maker which show the excellence of his work.

An earlier English maker was J. Marshall of Ludgate Street. In his microscopes the body or optical tube was generally covered with ornamented vellum or leather, and the mounts were of turned wood such as lignum vitæ. Lot 132, of which a full page illustration is given, is of twofold interest—firstly, because of the beautiful inlaid box base on which the compound microscope stands and in which it is to be packed, and secondly, because it was the property of Pope Benedict XIV, and bears the triple crown and the crossed keys in marquetry on its case. This Pope was elected in 1740, but whether he had any serious interest in science we know not. The perfect condition of the microscope and case and the completeness of the fittings suggest that they were not much or often used. Lot 255 is an extraordinary Dutch instrument, having a conical body two feet in length and a field lens five inches in diameter. This Brobdingnagian microscope is probably unique, but the same may be said of several other lots. Among the solar microscopes is one of which the body tube is supported by the uplifted arms of a carved allegorical figure, and another giant having a body twenty-four inches long and seven in diameter; only two instruments of the type are known; the other is in the Science Museum at South Kensington. There is a wealth of interesting objects in this collection.

Evolution of the Clinical Thermometer.—"Medicine is indebted to Galileo for the first contribution to thermometry," says William Shainline Middleton, in his article entitled Biographical History of Physical Diagnosis, which appeared in the December issue of *Annals of Medical History.* He goes on to say that "Galileo's first crude thermometer was constructed of a closed tube with a bulbous extremity. After heating this tube its opening was submerged in a vessel of water, whereupon the water rose to a certain level in the tube. Having established this point, the bulbous end of the tube was grasped in the hand and the body temperature was crudely measured by the expulsion of water from the tube, lowering the fluid level.

"Sanctorius (1561-1636), either ignorant of or disregarding Galileo's work, devised an instrument on improved lines for recording the body temperature by the mouth and to him belongs due credit for the first application of thermometry to medicine. The names of George Martine (1702-1741) and Carl Reinhold August Wunderlich (1815-1877) are inscribed indelibly in the development of clinical thermometry. The ubiquitous John Hunter (1728-1793) wrote his name in this field of clinical advance in 1766 by the following observation:

" 'I mentioned to Mr. Ramsden my objections to the common construction of that instrument (thermometer), and my idea of one more perfect in its nature, and better adapted to the experiments in which I was engaged. He accordingly made me some very small thermometers, six or seven inches long, not above two twelfths of an inch thick in the stem, having the external diameter of a ball very little longer than that of the stem, on which was marked the freezing point. The stem was embraced by a small ivory scale, so as to slide upon it easily, and retain any position. Upon the hollow surface of this scale were marked the degrees which were seen through the stem. By these means the size of the thermometer was much reduced, and it could be applied to soft bodies with much more ease and certainty, and in many cases in which the former ones could not be conveniently applied.' "

"The evolution of the clinical thermometer is a fascinating but intricate story. Suffice it to state that not until 1868, and through the offices of a contemporary clinician, Sir Clifford Allbutt, was the clinical thermometer developed in its present convenient form."

Editorial Articles

MAKERS OF MEDICINE

The beginnings of scientific medicine were made by the Greeks who may be truly termed the makers of medicine. Hippocrates knew and taught that diseases arose from the humors of the body and was indeed a scientific authority on dietetics, as he made clinical experiments to determine food values. He also wrote largely on medicine and surgery and on climatology. His knowledge of surgery was quite considerable. He applied the principle of extension in fractures as is done nowadays, and devised similar apparatus for the purpose. Hippocrates advocated trephining in contusions of the skull when the patient was unconscious but when there was no actual evidence of fracture.

Aristotle, perhaps the greatest of the Greeks, although not a physician had a deeper knowledge of physiology than any of the ancient sages. Galen, who by the way was a Greek by birth, and was educated in Alexandria, made valuable investigations of the nervous system and also investigated the anatomy and physiology of the brain and the spinal cord. For some centuries after the death of Galen not only was little progress made in the development of medicine but in many respects movement was retrograde.

It was in the fifteenth century that Vesalius in Paris first and afterwards in Padua began and continued those dissections which resulted in the publication of *The Structure of the Human Body* and was mainly instrumental in laying the foundation of anatomy. Harvey, profiting by the crude, but more or less true findings of earlier workers, Hippocrates, for instance, had observed that the bloodvessels were part of a connected system. Galen believed that the arteries contained blood not air; and that arteries and veins were connected, but he did not know that they were a closed system of branching tubes.

Servetus in the sixteenth century conceived the idea of a pulmonary circulation, and Andreas Cæsalpinus taught that blood flowed from the vena cava, through the right side of the heart to the lungs.

Harvey cleared up almost all the errors and laid the coping stone on the edifice imagined by others by describing the one action of the heart as the transmission of the blood and its distribution by the arteries to the extremities of the body, passing through the veins and thence to the right heart, lungs and left ventricle. However, Harvey had not been able to find the communication between arteries and veins. Four years after his death Malpighi observed the capillaries in the lung of a frog. Again for many years medicine remained comparatively dormant and it was not until the year 1830 and later when the microscope had been vastly improved that Schwann proved cells to be elemental parts of higher animals, a teaching confirmed and elaborated by Virchow in 1858.

The next epochmaking discovery was the germ theory of disease, which while led up to by many workers was completed by Pasteur in 1862 from which eventuated antisepsis and sepsis. Biochemistry promises to provide startling results and may inaugurate a new era in the conception of disease and the treatment thereof.

THE QUESTION OF EUGENICS

The question of eugenics is cropping up constantly. In some civilized countries the population is too large to be maintained or even fed adequately in existing circumstances. While in all civilized countries the least desirable part of the population is increasing out of all proportion and this is the case in this country. Restriction of immigration has been invoked to meet the situation. Civilization, as far as the number of inhabitants is concerned, is on the horns of a dilemma. There seems to be too great quantity and not enough quality. The intelligentsia, the cultured, the prosperous, and the fairly prosperous have few children, while the careless, improvident, and uneducated bear large families which, owing to environment and heredity, carry on the traditions of their parents. It is a problem bristling with difficulties and according to the eugenists can only be solved successfully by following their teachings.

There is little doubt that certain persons should not be allowed to propagate their species; those with mental defects, for instance, because they lack ordinary prudence and selfrestraint and reproduce their like without limit. It has been shown that a large proportion of criminals, habitual drunkards, and prostitutes, are likewise feebleminded and necessarily often influenced during the plastic years of youth by evil example and an environment of poverty and squalor. In the "good old days" such people were hanged or otherwise exterminated without mercy, and their offspring died like flies. Capital punishment has practically disappeared, and the children of the reckless and improvident are reared and educated, at the expense, more or less, of the thrifty and enterprising. It is no longer the survival of the fittest, but the survival of all who possess a spark of vitality, irrespective, to a large

extent, of their physical and mental equipment. It is obvious that the situation is precarious and even dangerous, and calls for remedies,—but are these remedies to be found in eugenics?

One of the latest propagandists of this mode of solving the problem is Dr. Barnes, the Bishop of Birmingham, who, arguing that the world at the present time is uncomfortably like "the world in that age of intellectual decline which heralded the break up of the Greco-Roman civilization, holds that the only way in which we can maintain our civilization depends upon whether we will listen to the eugenists and adopt measures to improve the racial quality of our people. But when we come to inquire of the eugenists themselves as to how this can be brought about, we find that there is no very definite eugenic plan. Professor Fleure, one of their leaders, speaking at the Educational Congress held recently in London, states there is not one best type of race, but many. Philosophers, American and European, have been deploring the decline of the great Nordic race, the big blonde people who have provided the majority of the governing classes in all the white nations. On the other hand, Nietzsche and other disrespectful men of science have alluded to this type as the "big blonde beast," and even Professor Fleure has had to allow that the simple mentality of this race is ill fitted to cope with the complications of social life and modern conditions. This seems to mean that people with brains are greatly if not chiefly needed. But how are these to be bred and surely the eugenists would not advise marrying or mating for the sake of brains alone.

Many eugenists in this country and in other countries insisted on the importance of having a clean bill of health before marriage, that is, the medical examination of those who desire to marry. There are, however, grave objections to this scheme. In the first place, who is to decide what physical or mental conditions or disabilities constitute a bar to marriage. Medical men themselves are not agreed as to which mental or physical defects or infirmities can be transmitted. It is agreed that feebleminded persons should not procreate, and the opinion is also almost unanimous that those infected with venereal disease, at least, in a gross form, or habitual drunkards should be debarred from marrying.

Again, is physical perfection the ideal to be reached in mating? A good physical equipment by no means signifies the possession of acute or able brains. Frequently, the contrary. It may be pointed out that infirm men and women of genius have not been rare, and that if eugenic laws had been in force, progress would have been much slower. The list of men and women of genius who have suffered from severe physical and mental disabilities and infirmities and who have given to the world gifts of incalculable value, is so long that it would easily fill an issue of this JOURNAL. Perhaps, it might not be an exaggeration to state that more men and women of genius have been weakly, sickly, and even crippled, than physically competent. Alexander the Great and Edgar Allan Poe were undersized, somewhat puny and neurotic men, strongly addicted to alcohol, and yet they played their parts and left names which giants of health must envy. In studying the problem of overpopulation and especially the overpopulation by those least fitted to carry the burden of life to the best advantage of all, eugenists seem to fail under existing conditions of knowledge regarding heredity. Broad principles of eugenics appear rationally clear, it is when the theory is submitted to searching analysis that no plain satisfying way out of the jungle is found.

ENCEPHALITIS LETHARGICA AND POLIOMYELITIS

While it seems to be the general view of the medical profession that encephalitis lethargica and poliomyelitis are specific diseases, there is much to say for the opinions of some medical observers that both these conditions are offshoots of influenza. In a communication to the *Lancet* December 30, 1924, Dr. F. G. Crookshank referring to the nervous element in lung collapse points out that atelectasis in poliomyelitis is a type of visceral paralysis which occurs with more or less frequency in this condition and in encephalitis lethargica and in influenza with nervous symptoms.

As a matter of fact the points of similarity in these conditions appear to suggest that these three maladies are not distinct but tend to run into one another, indeed, lead to the belief that encephalitis and poliomyelitis are offshoots of influenza. Dr. A. J. Brock, in a communication to the *British Medical Journal*, November 29, 1924, supplies arguments in support of Crookshank's thesis, that the occurrence of atelectasis, in influenza with nervous symptoms, in encephalitis and in poliomyelitis, is one more link in the proof of the incontestable and fundamental unity as Micheli calls it, between the cases at present sorted out under these various nosological labels.

In a further communication to the *Lancet* January 3, 1924, Brock expands the suggestion that there is a unity between these conditions by drawing attention to the fact that a more comprehensive mode of considering disease seems to be coming into vogue and in evidence of this change of attitude he refers to the note in the *Lancet* December 20th and 27th by Professor Ricardo Jorge on alastrim and variola and

to a letter by Dr. James Young, of Edinburgh, on bacterial pleomorphism in its issue for December 6, 1924. The note by Jorge is peculiarly suggestive, illuminating and instructive. It is true that the epidemics of smallpox which occur nowadays and which he designates alastrim are of a very much less virulent and deadly type than those which happened even a comparatively few years ago. The instance of the Province of Quebec in Canada is only one of the many cases in point. Nor is this due to vaccination, for vaccination protects from alastrim as effectively as from smallpox. In short, Jorge presents alastrim varicella, cowpox and the mild smallpox which are occurring frequently in different parts of the world as members of the varioloid family which differ but are related. Consequently Brock holds that under certain conditions of time and place, the different members of a group may run into one another, that one may in fact, i.e., clinically and for practical purposes, actually become another. These suggestions have much in their favor although they be opposed to the teaching of the day, and moreover have a considerable amount of clinical experience to uphold them.

Dr. Young illustrates from bacteriology the same principle enunciated by Dr. Crookshank and Professor Jorge from the clinical and epidemiological viewpoints. If encephalitis and poliomyelitis are offshoots of influenza and alastrim and some other complaints simulating mild smallpox are closely related to this disease and if as Dr. Young states various of the best known forms of microorganism, may, as a result of various changes in the medium develop from some kind of "bacterial plasm," our existing views as to the origin of disease may undergo somewhat radical revision.

HEALTH IN 1924

Whether or not a decreased death rate is, or is not, a sign of health, it seems to be the only indicator we have to use and it is at least a sign of decreased sickness. By this sign the year 1924 was, according to the experience of the Metropolitan Insurance Company, with its sixteen million industrial policy holders in the United States and Canada (about one seventh of the population of these two countries), the healthiest year ever known.

Among the causes which have contributed to the decline of the death rate over immediately preceding years, a mild winter was no doubt the most important. The combined death rate from influenza and pneumonia was 21.5 per cent. lower than for 1923, and the decline in the general death rate is accounted for chiefly by the abatement of these two related scourges. Influenze is, doubtless, on a periodical decline from lack of timber to work upon, but these two diseases are certainly made more frequent and more deadly by severe weather.

Typhoid reached a new low rate in the experience of the company. The report states that "the problem of typhoid control in America is now almost entirely one of rural sanitation." This disease is still looked upon with fatalistic unconcern in certain sections of the country, and the inhabitants are much more interested in the local "specialist" in the treatment of typhoid than in the health officer, who attempts to improve their water supply.

Tuberculosis reached a new minimum. Tuberculosis has, of course, been on the decline for a hundred years or so, and it has been been a mooted question as to how much of its falling off in recent years has been due to medical and public health work. There can be no question that these have influenced its decline to some extent, and as much by indirect as by direct methods. A safe milk supply probably is having more effect than any other condition. We are still much in the dark as to modes of infection, but doubtless most of it occurs through the alimentary tract and at an early age. Better living and better factory conditions have also contributed to the falling rate.

The rate for cancer is slightly less, but higher than for any year before 1921. The company estimates that "more than two per cent. of the cancer mortality during a period of twelve years has occurred among persons under twenty-five years of age." Also, "if a boy or a girl once reaches the age of ten, there is more likelihood of ultimately dying from cancer than from tuberculosis. . . . Of one hundred boys, ten years old, more than eight will eventually die from cancer, whereas less than seven will succumb to tuberculosis."

The death rate from diabetes declined about one point per 100,000 from that of 1923, doubtless due to the use of insulin.

The rate for chronic nephritis is the lowest in the history of the company; and for cerebral apoplexy, the lowest except for one year; while heart disease declined for the first time since 1919. "Under present conditions a child who lives to the age of ten is three times as likely to die of heart disease as from tuberculosis" and, of course, this likelihood increases with age.

The death rate from alcoholism declined slightly over that for 1923, though it is still much higher than for 1922, 1921, and 1920.

Though the general accident rate declined slightly, the deaths from automobiles increased to sixteen in 100,000. "Mortality from this cause has more than doubled since 1916, has tripled since 1915, quadrupled since 1913, and increased sevenfold since

1911. The automobile is responsible for four times as many deaths as railroads, and more than twice as many as by accidental falls or drowning."

ASTHMA AND ANAPHYLAXIS

Asthma in itself is not a fatal disease, and asthmatics reach not infrequently a green old age. In a book of addresses written by Dr. Arthur F. Hurst [*Essays and Addresses on Digestive and Nervous Diseases and on Addison's Anemia and Asthma.* London, William Heinemann, Ltd., 1924] it is pointed out that Sir JoJhn Floyer, who published the first book in the English language on asthma in 1698, was himself an asthmatic. In spite of this affliction, as Dr. Johnson put it he "panted on to ninety." Of late years a new light has been thrown on the causation of asthma. Several years ago Hurst defined asthma as the reaction of an overexcitable bronchial centre to blood borne irritants and to peripheral and psychical stimili.

The most recent investigations on the subject deal with the relation of asthma and anaphylaxis. Some of the incomprehensible individual variations in the etiology of asthma have been cleared up more or less. The irritant of the bronchi is generally a protein to which the sufferer is intensely sensitive. According to Hurst, whether a person who is sensitive to a certain protein will be unaffected by exposure to a moderate dose of it, or whether he or she will develop asthma, an urticarial or eczematous rash, an acute gastrointestinal attack depends upon whether he is otherwise normal, or whether he has an irritable bronchial centre, an irritable skin, an irritable digestive tract, or the irritable foci in the brain, upon which migraine and epilepsy respectively depend.

Walker, of Harvard, has made probably the most extensive researches into the matter. Walker found that fifty-two per cent. of four hundred cases of asthma and Coke in England found that the same percentage of three hundred and fifty cases, gave positive reactions to the cutaneous tests, which Walker was the first to use on a large scale for recognizing hypersensitiveness to proteins. Hurst's own experience and that of his colleagues and of other investigators in France and England with whom he has compared notes has been very disappointing, but he still thinks that the frequency of a toxic idiopathy as a factor in asthma has not been exaggerated by Walker or Coke.

The anaphylactic factor is most common in cases beginning in early life and the special liability in children is most marked with food proteins, and next with animal proteins. Sensitiveness to bacterial proteins and according to Coke, to feathers, is equally distributed whatever is the age of onset up to forty. With regard to pollen and hay fever investigations in this country have been much more extensive than perhaps in any country because the variety of pollens which cause the complaint is considerably larger than in Great Britain. As a matter of fact grass pollen is the only one of any great importance in Great Britain. As for animal emanations which may cause asthma in those unduly sensitive, Hyde Salter, in England, recognized this idiosyncrasy as long ago as 1859. Domestic animals as well as guineapigs, rabbits, hares, cattle, sheep and deer will bring on an attack, of which horse, cat and dog asthma are the most common by far. Hurst draws attention to the point that careful inquiry into the patient's history may lead to the discovery that attacks are caused by other animals, such as rats and mice, or even by parrots. Also asthmatics are occasionally sensitive to other proteins in addition to those referred to already. Indeed some of the idiosyncrasies to which asthmatics are prone are quite remarkable. Some asthmatics show a hypersensitiveness to aspirin.

There is a tendency among American writers in particular to range all the phenomena of the toxic idiopathies socalled under anaphylaxis, and according to certain French authors a toxic idiopathy or hypersensitiveness to a certain protein depends in part upon the fact that the protein has the effect of depressing the activity of the suprarenals. Hurst is of the opinion that usually only those functions in which the adrenal control is specially important for the particular individual are affected. Thus an asthmatic will have an attack of asthma, and a person with a sensitive vasomotor system will develop urticaria or other vasomotor disturbances of the skin. A man who has a tendency to gastrointestinal attacks owing to the abnormal irritability of his digestive tract will vomit and have diarrhea and abdominal cramp owing to exaggerated peristalsis and relaxation of the cardiac, pyloric and ileocecal sphincters. In this way is explained idiosyncrasies to shell fish, eggs and other foods, which are manifested by acute digestive disturbances. In some cases the idiopathy is exhibited in an attack of hay fever.

More or less frequently a general tendency to toxic idiopathies is inherited. This may manifest itself in different members of the family as asthma, hay fever or digestive disturbances, depending upon the inheritance or acquisition of an irritable bronchial, nasal, or digestive system respectively. While the investigations of research workers and of American workers, in particular, have demonstrated the cutaneous hypersensitiveness of many asthmatics to special foreign proteins, further research is needed before it can be accepted that anaphylaxis accounts for all cases of asthma, but it may be taken as proved that it is an important factor in many.

Obituary.

SIR THOMAS CLIFFORD ALLBUTT, K.C.B., P.C., F.R.C.P., F.R.S.

Cambridge, England

The sudden death of Sir Thomas Clifford Allbutt, regius professor of physics in the University of Cambridge, early in the morning of February 22d, at the ripe age of eighty-eight years, removed from British and international medicine a dominating figure, and from the University of Cambridge one of its most outstanding personalities.

Thomas Clifford Allbutt was the son of a clergyman in Suffolk, an agricultural county in the eastern part of England, and was born on July 20, 1836. He entered Cains College, Cambridge, where he gained several scholarships, taking his degree in arts with first class honors in the natural science tripos with distinction in chemistry and geology. He became Bachelor of Medicine in 1860, and began to practise in Leeds, where he was made physician to the General Infirmary. In 1882 he was elected a Fellow of the Royal College of Physicians. In 1892 he was appointed regius professor of physics in the University of Cambridge in succession to Sir George Paget, and physician to Addenbroke Hospital.

In 1881 he published a very important work on the ophthalmoscope in medicine. It may be said that his instrument was invented first by the late Charles Babbage, but attracted little or no attention until it was constructed in modified form by Helmholtz, and was brought back to its original form by Ruste. In the course of a few years it revolutionized knowledge of the internal diseases of the eye, and largely through Allbutt's comprehensive work it was demonstrated that the value of the instrument would not be confined to ophthalmic practice, but would be extended to the diagnosis of diseases of the brain and nervous system.

He invented a new clinical pocket thermometer, the former clinical thermometers in the late sixties were at once so cumbrous and fragile that outside the wards of a hospital they could be little used. The present clinical thermometer is due to his ingenuity.

In 1885, he published with Pridgin Teale, the well known Leeds surgeon who died at a great age a few years ago, a volume of clinical lectures *On the Treatment of Scrofulous Necks,* in which the authors advocated surgical intervention in place of the older *laissez aller* methods of allowing the tuberculous glands of the neck to come to a head and break, leaving unsightly scars. In 1884 he delivered the Goulstonian Lectures, on visceral neuroses, before the Royal College of Physicians; in the following year he lectured on scrofula and in 1896 on diseases of the heart. During the years 1896-99 he edited a great *System of Medicine,* with so striking and immediate success that a second edition was called for almost at once. In the preparation of this edition he had the aid of Sir Humphrey Rolleston. He was the author of many other publications, including *Science and Medieval Thought, The Historical Relations of Medicine and Surgery,* and *Diseases of the Arteries and Angina Pectoris.*

Allbutt was a remarkably active, energetic man, and in spite of his professional claims found tim for a great deal of public work. He was a membe of the Committee of the Royal Society and vice president from 1914 to 1916. He was also examine in medicine to the Royal College of Physicians i London, and to the University of Oxford. Honor were literally showered upon him by learne and scientific bodies. Among the honorary de grees which he accepted were the D.Sc. o Cambridge University, the D.Sc. of Oxford Uni versity, the LL.D. of Glasgow University, the M.D of Dublin University, the D.Sc. of Victoria Univer sity, the D.Sc. of Leeds University, the LL.D. o McGill and Toronto Universities, the Fellowship o the Royal College of Physicians of Ireland and of th New York Academy of Medicine, an honorary mem ber of the American Academy of Arts and Science and an honorary member of the Association o American Physicians. When approaching the ag of eighty, Allbutt in 1914 was elected president o the British Medical Association, and held that posi tion during the trying years of the war.

Allbutt took an active part in the wordy and pe and ink warfare aroused by the passing of the Na tional Health Insurance Act in 1912. He took th stand that the act must create and nourish a spiri of research and of scientific diagnosis and provid for these pursuits accordingly. He argued that th scheme must not encourage the nation to rely o curative and remedial medicine alone, but must creat a preventive medicine by promoting researches int the causes of disease and the means of prevention.

He lost no opportunity of impressing his views o the profession and the public that prevention of dis ease was of greater importance by far than treat ment, and that efforts to stamp out or abate disease should be centred largely in providing means fo finding out the causes of disease and for preventing them from developing. It is somewhat of a coin cidence that two great British physicians who held these opinions, Sir James Mackenzie and Sir Clifford Allbutt, should have passed away within a few weeks of each other. Both, too, it may be added, concentrated much of their attention on diseases of the heart and circulation. Allbutt had decided views concerning diseases of the arteries and angina pectoris. He was a man of commonsense and had little patience with medical fads and obsessions.

Personally, Allbutt was one of the most charming of characters. Unlike most great men he was loved even more than he was respected. His learning was both extensive and varied, in fact, an old friend o his at Cambridge, himself a Fellow of Cains College, once said to the writer that Allbutt was so versatile that he sometimes wondered how he had found time to acquire his deep knowledge of medicine. He possessed unfailing courtesy and a remarkable sweetness of temper, combined with wit, wisdom, and humor.

An appreciation of this great physician and fine gentleman in the highest sense of the words, will be incomplete without mentioning his unusual gift of diction and phraseology. He was a good speaker, but a writer of an almost unique distinction. Among the medical writers of his generation he towered. By the death of Sir Clifford Allbutt, the medical profession of English speaking lands has lost its chief link between Victorian and modern medicine.

News Items.

Doctor Ney Honored.—Dr. K. Winfield Ney, dean of the New York Polyclinic Medical School and Hospital, was guest of honor at a dinner given by the teaching staff at the Hotel Astor, March 7th.

Presbyterian Hospital Fund.—The campaign for the Columbia-Presbyterian Hospital Medical Centre is still being carried on. The most recent report announces a total of $2,294,990. Gifts recently reported are $500,000 from Mrs. Stephen V. Harkness, the largest single donation, and $400,000 from an anonymous donor.

Recognition for Doctor Dick.—The following cable sent to the Nobel Prize Committee of Stockholm by the board of directors of the New York Committee of the Gorgas Memorial, has been made public: "Gorgas Memorial Institute of Tropical and Preventive Medicine respectfully recommends for consideration by the Nobel Prize Committee, Doctors George and Gladys Dick of Chicago, in recognition of their work in prevention and cure of scarlet fever."

Admittance of Students to Johns Hopkins.—Changes have been made in the method of admitting medical students to Johns Hopkins, limiting admittances to "Grade A" candidates after individual study of the applicants. It is expected this will reduce the classes to fifty-five or sixty, although seventy-five will be accepted if qualified. Personal interviews with the assistant dean, or with regional representatives in case the student lives at some distant point, will be required.

Leonard Prize for Research.—The American Röntgen Ray Society will award one thousand dollars to the author of the best piece of original research in the field of röntgen ray, radium, or radioactivity (not involving a patent or copyright). Papers must be in English, and submitted not later than May 1, 1925, and the winning article must also be presented at the annual meeting of the society, September, 1925. The prize commemorates Dr. Charles Lester Leonard, a martyr to his research in the field of the röntgen ray. Details of the competition may be obtained from Dr. George W. Grier, Chairman, 8088 Jenkins Arcade, Pittsburgh, Pennsylvania.

Dedication of Sterling Hall at Yale.—The Sterling Hall of Medicine, a $1,425,000 building made possible by the bequest of John W. Sterling of the class of 1864, was recently dedicated at Yale University. Mr. Sterling, a noted corporation lawyer, who died in 1918, left the bulk of his estate to Yale, from which the Sterling Chemistry Laboratory was built, and which will provide the Sterling Memorial Library. The new Hall of Medicine is opposite the New Haven Hospital. It provides an auditorium seating two hundred and fifty. The building was presented to the university by George Hervey Church, representing the trustees of the estate, and was accepted on behalf of the university by Dr. James Rowland Angell.

Gorgas Memorial Meeting.—The executive committee of the Gorgas Memorial recently held its first meeting at the New York Academy of Medicine. Additional members elected to the executive committee were Dr. Nathan Van Etten, Dr. Wendell Phillips, Mrs. William G. Willcox, and Mr. George Gordon Battle. Dr. Ernest Fahnestock was appointed chairman of a citizens' committee for New York City, and Dr. Samuel Kopetsky was elected chairman of an advisory publicity committee. A series of radio talks were proposed, the first to be an address of Dr. George David Stewart, to be given before physicians and laity at the Fifth Avenue Hospital, Gorgas Memorial Evening, Wednesday, March 18th. Generous response was reported to the appeal for a five million dollar endowment.

Personal.—Dr. William Seaman Bainbridge of New York delivered an address on The Present Status of the Cancer Problem before the American Röntgen Ray Society, meeting at Detroit, February 19th.

Dr. Mabel E. Elliott, well known for her relief work in the Near East, will go to Japan in the near future as a medical missionary under the National Episcopal Missionary Board.

Dr. Arthur A. Landsman gave a paper, by invitation, before the Bronx Physicians Club, on Causes of Bleeding from the Rectum, on February 19th.

Dr. H. Harris Perlman, instructor in diseases of children at Jefferson Medical College, Philadelphia, has been appointed medical director of the Ocean City Seashore Home for Babies, Ocean City, New Jersey.

International Congress on the History of Medicine.—The fifth international congress on the history of medicine will be held from July 20th to 25th, at Geneva, Switzerland.

International Birth Control Conference.—The sixth International Neo-Malthusian and Birth Control Conference will be held at the Hotel McAlpin, New York, March 25th to 31st.

Meeting of American Stomatological Association.—The New York state society of the American Stomatological Association will hold its last monthly meeting Tuesday, April 14th, at the New York Academy of Medicine, to which all practitioners are invited.

Course in Medical Diagnosis.—Conferences in medical diagnosis and pathology will be given by Columbia University, at the Presbyterian Hospital, to graduates in medicine, from June 1st to July 10th. Dr. George M. Mackenzie and Dr. William C. Von Glahn will be instructors.

Lectures at Johns Hopkins.—The Charles E. Dohme Memorial lectures for 1925 will be given at Johns Hopkins University Medical School, May 8th to 11th, by Dr. Arthur R. Cushny, professor of pharmacology of the University of Edinburgh, on the subject of Optical Isomers in Biology.

Tuberculosis Institute.—A regional institute for tuberculosis workers will be held in Philadelphia March 25th to April 8th, by the National Tuberculosis Association and the Pennsylvania School of Social and Health Work, for the purpose of studying methods of education and organization.

International Congress on Military Medicine and Pharmacy.—The third international Congress of Military Medicine and Pharmacy will be held in Paris, April 20th to 25th, at Vâl-de-Grace. All officers belonging, or having belonged to the army or navy medical corps of allied, associate, or neutral nations, are invited. There will be scientific meetings and demonstrations of equipment.

Lectures on Medical Hydrology.—The University of London announces a course of lectures on medical hydrology to be delivered at the University (South Kensington) with demonstrations and lectures at Buxton, a British spa, to be given from April 27 to May 2. Applications with fee of £1 1s. should be received before April 17th, by Miss Hilda Fox, University Extension Department, University of London, South Kensington, S. W. 7, London.

Course in Public Health Work.—The University of Michigan announces a six weeks' summer session in public health, from June 22nd to July 31st. The courses will be conducted by members of the faculty, augmented by special instructors of national reputation. A bulletin of information may be obtained from Dr. John Sundwall, Director, Division of Hygiene and Public Health, University of Michigan, Ann Arbor, Michigan.

Northwestern University News.—The new dean of the medical school is Dr. Irving Samuel Cutter, for ten years dean of the college of medicine of the University of Nebraska. The former dean, Dr. Arthur I. Kendall, has accepted an appointment as professor of bacteriology and public health at Washington University Medical School.

A Chicago physician, who requests that his name be withheld, has given the sum of $150,000 to the medical school, for instruction in clinical medicine, and for assistance to the poor and unfortunate of the city.

Society News.—The New York Ophthalmological Society has elected the following officers: President, Dr. Henry H. Tyson; vice-president, Dr. W. G. Reynolds; secretary and treasurer, Dr. John H. Dunnington.

A joint meeting of the Philadelphia Academy of Surgery and of the New York Surgical Society was held at the New York Academy of Medicine, February 25th.

The following officers for 1925 were elected by the Kings County Homeopathic Society, at its annual meeting held January 27th at the Cumberland Hospital: Dr. Charles A. Brown, president; Dr. Royal A. Abbott, first vice-president; Dr. H. S. Ducret, second vice-president; Dr. Farrand Pierson, secretary, and Dr. C. J. Ohlbaum, treasurer. Because of the clinical facilities offered it is proposed to hold all its future meetings at hospitals.

The Medical Association of the Greater City of New York, at its recent annual meeting, elected the following officers for 1925: President, Dr. Louis Faugères Bishop; vice-president, Dr. Thomas C. Chalmers; recording secretary, Dr. Ernest Ellsworth Smith; chairman for the borough of Brooklyn, Dr. Robert E. Coughlin; chairman for the borough of Richmond, Dr. William Bryan; chairman for the borough of Queens, Dr. Henry C. Courten.

Book Reviews

TREATMENT

Physiological Principles in Treatment. By W. Langdon Brown, M.A., M.D., Cantab., F.R.C.P. Fifth Edition. New York: William Wood & Company, 1924. Pp. 511.

This splendid book, and now its fifth edition, lives right up to its title. The author makes every sentence say something definite, and therefore the book furnishes ready, quick information on physiological facts so necessary for rational therapy.

The author has covered a great deal of ground in this small book, which includes a very complete index. He gives briefly some of the facts on organotherapy; a very complete discussion of the digestion; disturbances of the stomach and intestines; advice on rectal feeding, and he well discusses the functions and ordinary diseases of the pancreas and liver. He has an up to date chapter on diabetes, acidemia and ketosis; carefully discusses proteins and their metabolism and the various normal and abnormal excretions of the kidneys. The chapters on vasomotor disturbances, hypertension and irregularities of the heart are all brought, in this edition, right up to the present time. The last chapters of the book are devoted to the subject of vitamines and calcium metabolism.

If every practitioner would keep up with the science of physiology, nutrition and chemical biology he would be more rational in his treatment of disease and abnormal conditions. This book aims to help the practitioner toward that end, namely, to have his therapy based on the foundation of the physiological and biological processes of the body.

BIOCHEMISTRY

Principles of Biochemistry. For Students of Medicine, Agriculture, and Related Sciences. By T. Brailsford Robertson, Ph.D., D.Sc. Second Edition. Thoroughly Revised. Illustrated with Fifty-seven Engravings. Philadelphia and New York: Lea and Febiger, 1924. Pp. 796.

The second edition of this classical work contains much additional matter as compared with the first. The new sections that will probably appeal most to physicians are those dealing with the neutrality of the blood, metabolism in diabetes, growth, and the relationship of growth to diet.

The volume as a whole remains a model of what a textbook may be when knowledge of the subject, common sense, imagination, skill in exposition and native charm of style combine in its production.

Contrasting this book with the standard physiological chemistries of one or two decades ago, one is struck by the ever widening associations of the subject, not only with every field of modern medicine, but also with the parent subjects of physiology and biology and the related sciences of agriculture and industrial chemistry. Besides, at every turn, increasing use is made of mathematical concepts and of the laws of physics and physical chemistry. These are indeed the very things that so often appear to "practical" physicians, as insuperable barriers to the acquisition of what is after all a new science. Yet, such is the didactic skill of the author, so obviously sincere his willingness to "explain from the bottom" whenever he senses a possible difficulty in the mind of his reader, that even the most hurried practitione can hardly fail to find pleasure as well as prof in the pages of this volume.

It is always a difficult task to select for specia comment individual sections in the face of so excel lent a presentation of so broad a subject. In additio to the basic chapter on the food stuffs themselves there are most stimulating discussions on the genera properties of protoplasm (containing chapters o crystalloids and colloids), on the chemical correla tion of tissues (with chapters on the blood and lymp and on the chemical regulation of circulation, diges tion, generation, and metabolism); on the chemi cal processes which underlie life phenomena (includ ing here the chapter on growth): on the products o tissue activity; and lastly on the energy balance o the organism.

The final chapter on the outlook—which for tunately has been reproduced in toto from the firs edition—remains a splendid essay on what biochem istry may be expected to give to our industrial life to agriculture, to food conservation and food syn thesis, and to medicine—particularly to therapeutics immunology, and to the control of senesence.

VENEREAL INFECTIONS IN WOMEN

Common Infections of the Female Urethra and Cervix. B Frank Kidd, M.A., M.Ch. (Cantab.), F.R.C.S. (England and A. Malcolm Simpson, B.A., M.B., D.P.H. (Cantab.) With Additional Chapters by George T. Western, M.D and M. S. Mayou, F.R.C.S. Oxford Medical Publications London: Humphrey Milford; New York: Oxford Uni versity Press, 1924. Pp. xii-191.

The authors have assumed the task of elevatin venereal diseases to that same dignified level ac corded to other specialties. This book is the resul of intensive efforts in that direction.

A chapter is devoted to general diagnosis an shows how to examine a woman suspected of gonor rheal taint, so as to determine the presence or ab sence of infection, or the fact of cure. The succes sive steps in this procedure are cited. The femal venereal clinic should be a sorting house for wome who are admitted to the hospital for a vaginal dis charge or painful micturition. The author insist that the venerologist should not confine himself t this specialty and that he should have training i gynecology and genitourinary surgery as well as i general surgery and medicine. The chapter on gen eral treatment is well worth reading and gives th most minute care to the details of management. Th special diagnosis and treatment of vulvitis, vaginiti and bartholinitis includes also notes on pudenda sores and their management. The diagnosis an treatment of urethritis and its complications is valu able as it contains much useful information. Th same may be said of the chapter on the diagnosis and treatment of cervicitis. The treatment, particu larly, is discussed in great detail. The chapter or endometritis, salpingitis, oophoritis, pelvic cellulitis and peritonitis, which, strictly speaking, are some what extraneous to the subject of the book, may wel be included because of their complicating nature Gonorrhea in female children, that bugbear of in-

stitutions for female children, is given the attention that it deserves. The treatment of gonococcal arthritis in women is presented in painstaking detail.

The bacteriology of the gonococcus is discussed by G. T. Western and ophthalmia neonatorum is taken up by M. S. Mayou. There is also a chapter on gonococcal proctitis, osteitis and the use of vaccines. It is maintained that the principle of artificial immunization by means of vaccines holds out the most hopeful line of research for the discovery of a specific and rapid remedy for gonorrhea. There is still much work, however, to be done along these lines.

In the chapter on prophylaxis, the keynote of the whole situation is said to lie in properly designed and properly used prophylactic packets. They should not be given out promiscuously. Delayed prophylaxis allows its use the next morning, when it is more likely to be used intelligently and deliberately.

An appendix contains an analysis of 650 consecutive cases examined at the Female Gonorrhea Section of the Venereal Clinic of the London Hospital, 1917 to 1920.

This book may well be recommended to those interested and is a valuable contribution to the literature. Its style is impressive and it is full of valuable information on the subject.

LIFE INSURANCE

Life Insurance Examination. Edited by Frank W. Foxworthy, Ph.B., M.D. St. Louis: C. V. Mosby Co., 1924.

Including the editor, this book represents the collaboration of fifty associates who are experts in the subjects of which their chapters treat. The chapter on the history of life insurance is extremely interesting, and the forty-seven subsequent chapters treat of every branch and subject of human life, health and disease that can be of interest and instructive to a medical examiner of insurance risks. Many of these chapters also show the problems and the operation of the medical departments of insurance companies.

Many parts of this book, with illustrations, would seem out of place in a book on life insurance examinations. They really partake of the practice of medicine, and laboratory examinations that are rarely made by the medical examiner. Such parts might have been omitted but of course they make the book more complete for reference. The whole object of the book is to raise the standard of the medical examiner.

On page seventy-eight it is stated that the medical examiner is the "eyes of the medical department," and the success of the insurance company depends upon his honesty and his professional and personal attainments.

On page 113 it is stated that the medical examiner is appointed solely on his professional attainments and qualifications. This is generally the case, and should always be the case, but as a matter of fact, very frequently medical examiners are appointed at the instance and urge of the agents in the field.

In the chapter devoted to the examination of women, the examiner is told to have the woman disrobe the upper part of her body, and then with safety pins to fasten a front and back towel draped over her, and then the examination may be made at the loopholes at the side by lifting the towel. This advice is absolute perfect nonsense. In this age of women who wear little most of the time and almost nothing at dances and at the seashore, to hamper the examiner with the rubbing and rasping of towels on the stethoscope is absurd. The risk of accepting a female applicant is greater than the risk of accepting a male applicant. On what ground should the medical examiner be hampered? Also, the abdominal examination of female applicants is not sufficiently emphasized, which is very evidently quite important.

With all these many chapters aiming towards the efficiency of the medical examiner, there is not a single word on the compensation that the medical examiner should receive. He is required to be at the top notch of the medical profession, and with the enormous number of questions now asked, with the extra scientific physical examinations that he must make and then plot some of his findings on diagrams, his fee, for practically an hour of professional scientific work, is only five dollars. This same amount was the fee paid about fifty years ago. Every other employee of an insurance company from the woman cleaner and the office runner to the president has had her or his wages or salary trebled and quadrupled. What about the examiner in the field who is "the eyes of the company"? When will the worm turn?

The reviewer believes that this is probably the best book that has been written on the subject of life insurance, and it should be owned by every examiner.

NUTRITION

Nutritional Physiology. By Percy Goldthwait Stiles. Fifth Edition. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 307.

This (fifth) edition of Stiles's helpful book includes the new work on insulin and on the vitamines.

The book remains a needed and useful introduction to that bugbear of the student and older practitioner—the subject of nutrition. The presentation is lucid and the style informal and pleasing. The method of simplifying the explanation of difficult concepts by the use of homely similes is much to be recommended.

The book should be a great aid to students and to physicians wishing to follow the "newer metabolism."

Fasting and Undernutrition. A Biological and Sociological Study of Inanition. By Sergius Morgulis. New York: E. P. Dutton and Company, 1923. Pp. 407.

In Professor Carlson's book, *The Control of Hunger in Health and Disease,* written in 1916, occurs this passage: "The layman may question the practical utility of hunger control to society on a whole, in view of the fact that it has played no rôle in past evolution. . . . *In these times of plenty* (italics ours), overfeeding . . . is on the whole more prevalent than malnutrition."

Less than a decade later appears the work of Professor Morgulis on *Fasting and Undernutrition.* During the interim society has been rent by conflict, plenty has largely been succeeded by want, and want by starvation. What was in 1916 the special and leisurely study of a few learned experimenters has now become the anxious concern of untold thousands—and the scientific reading public is therefore in a particularly receptive mood to welcome Morgu-

li's book as a second great American contribution to the subject of hunger and malnutrition.

Morgulis begins his work with a splendidly written —the style throughout is excellent—introductory chapter and then proceeds to divide his subject into three parts: Physiological Inanition; Experimental Inanition; and Inanition and Growth. In each of the first two groups he discusses in turn the associated chemical, physiologic and morphologic phenomena.

Under the heading of physiological inanition the author discusses hibernation, metamorphosis and the inanition of the breeding season in salmon. Experimental inanition covers the subjects of more direct clinical hearing such as acute inanition, partial inanition (including vitamine starvation), chronic inanition and intermittent inanition. The book closes with an exhaustive international bibliography (almost one hundred pages) and an author and a subject index.

Morgulis's book is not a clinical treatise, yet it should be in the hands of every physician, not only as a reference guide to all the known facts pertaining to the subject, but as an inspiration and a powerful stimulus to think of malnutrition, to diagnose malnutrition, and to prevent and treat this ever present, but heretofore sadly neglected condition.

LAURENCE STALLINGS

Plumes. A novel by Laurence Stallings. New York: Harcourt, Brace & Co., 1924.

What Price Glory. A play by Laurence Stallings and Maxwell Anderson. Unpublished.

"What chance has that poor little boy . . . against all these dead men?"

Thus Richard Plume's struggle to find himself ends. He, too, was just a poor little boy inspired by the traditions of the past. He meets actuality, ghastly facts that elders have lied about, silvered over with romance, with the colored tatters of forgetfulness. They also had had to continue the lie or see their souls perish. The old men ruling the mob; the individual who dares to oppose the old men, mobbed. Emotional responses of archaic times persisting to this day everywhere! And man's manual skill, his artisan intelligence inventing, plotting devices good and evil, building "civilization" only to tear it down again as soon as the primitive emotions are touched. We have no right to call ourselves civilized as long as there are wars. No ancestor worshippers are civilized—in the ideal sense of the word. To be able to live as a herd—that is all our socalled civilization really means. And anyone threatening that herd is thrown out, pilloried, crucified in true pagan fashion.

Plumes should be read and reread by everyone till some hint of its everlasting truth penetrates the thickest mob brain. *What Price Glory* should be seen till the protesters begin to recognize the pathological nature of their herd reaction. Lawrence Stallings's works should be rammed down the throats of those who sit back complacently and try to escape by murmuring "Very interesting." They should be used as a flail for those whose shivering flesh cannot bear the "unnecessary." When that vast body of the middle class understands its own orgastic pleasure in the sacrifice to the past on the altars of war, understands and feels in new terms of emotion, then there may be hope of civilization!

The book of *Plumes* gives the postwar attempt at readjustment of one Richard Plume. His ancestors have broken themselves for tradition and war glory. Like a disease handed from father to son it riddles them all. Richard Plume as he struggles to come up from the abyss where all his ties to life and human thought lie shattered, determines he shall be the last to be so sacrificed. But the "old men," mob worship, mob emotion, stand just as unmoved, casting their jagged shadow over his happy little son.

This is the story of a soul fighting against the world. This is the story of a man seeking to know himself. The rest of the world crashes inevitably as he rears his head through the temple top. Like Samson he is caught in its downfall. But Samson was killed in those far away days. Plume is only pinned down; he may free himself yet.

This then is the core of Stallings's mental life. The sparks that are shot out by the hammering on that essential core turn to individual jewels. *What Price Glory* dwells for a moment on the tinsel garments of war. People don't like to see anything naked, and these garments turn out to be so paltry, so filthy, that by contrast the pure hard tragedy of war can be realized. For once someone has got past the trappings. Lawrence Stallings and his coworker, Maxwell Anderson, are turning the very words of the mob inward. Perhaps after all these centuries the primitive mouthings will sound for what they are worth. I do not mean the language of *What Price Glory.* I mean the "Back to Democracy," the "shocking," the "unnecessary," all the ready phases of those who borrow their minds from their ancestors, not to use by any chance, but just to have handy in case there is any "thinking" to be done.

Medicoliterary Notes.

Dr. Robert Oleson, of the U. S. Public Health Service, has recently completed a thyroid survey of elementary school children in Cincinnati, the results of which have been published as Reprint No. 941 from the *Public Health Reports.*

* * *

The *Forum* for March contains a number of articles of unusual interest. Among them are Is Paychoanalysis a Science? in the form of a debate between George Sylvester Viereck arguing for the affirmative and Aldous Huxley for the negative; America and Roman Catholicism by Michael William; What Is Civilization?—The Answer of the Middle Ages, by Ralph Adams Cram; Biology Moulding the Future, by J. B. S. Haldane; and The Christianity of Christ, by Joseph St. Loe Strachey.

* * *

Dr. Louis I. Dublin, of New York, contributes an interesting article to the December number of the *Nation's Health* on the automobile as the outstanding cause of highway accidents. Accidents due to all other vehicles, including steam and electric railways, horse drawn vehicles, bicycles and motor cycles, have decreased steadily; fatal automobile accidents have just as steadily increased.

* * *

Legislation regarding the preservation and promotion of the public health must and will be considered and passed for many years to come. There is no reason why it should not be scientific, practical, adequate, and successful if the sponsors of such legislation when drafting it will follow common sense rules. . . . Then will a law survive the test of the courts and be a reasonable, admirable, and ideal

method of safeguarding the nation's most valuable asset, the health of its people.—J. A. Tobey in *How to Draft New Health Legislation.*

* * *

The most interesting plays now running, judged from a psychological point of view, are *What Price Glory?, They Knew What They Wanted,* and *Candida;* in a second class, of interest but not so perfectly done, may be mentioned Joseph Schildkraut in *The Firebrand,* supposedly a chapter from the life of Benevenuto Cellini; Mary Blair in Eugene O'Neill's *Different;* George Arliss in Galsworthy's *Old English;* and the much discussed *Desire Under the Elms.*

* * *

The literary reviews of England, where Jeanne Bordeux's *Life of Eleonora Duse* has been published by Hutchinson & Company, seem for the most part to find the book a sincere outpouring of love and admiration on the part of the author, and an accurate presentation of the facts of the great actress' life and career, but "florid rhetoric and gushing torrents of unmeasured praise," and "overloaded with emotional commentary."

* * *

As an aid in giving the findings publicity, and that they may be available to a wider public, the *Nation's Health* for December reprints the major conclusions of the final summary report of the Framingham Community Health and Tuberculosis Demonstration. The report of this demonstration (Framingham Monograph No. 10) is an outstanding document of the present day movement in health fields, and is deserving of the most careful study and consideration by all workers in the field.

* * *

The Alienist in Court is the title of an article in the February *Harper's* by Dr. Joseph Collins. It is a discussion of expert testimony.

* * *

The total number of typhoid carriers listed in New York State, exclusive of New York City and State Hospitals, on October 1, 1924, was ninety-six, according to *Health News.* Of this number twelve were discovered and added to the list after January 1st. These twelve carriers are considered to have been responsible for fifty-three known cases of typhoid fever. Eight of these carriers were discovered as the result of efforts of local health officers, two by attending physicians, and two by representatives of the state health department.

* * *

The much discussed portrait of Lady Astor, which was removed not long ago from Guildhall in the House of Commons, is still, the British press reports, under consideration, but in the meantime the picture is being loaned to the Bedford College for Women. This is the oldest university college for women in England. It had among its early students George Eliot and the daughters of Dickens and Cobden.

* * *

The Rockefeller Foundation has made a grant to the Canadian National Committee for Mental Hygiene of $75,000 for research, experimentation and mental hygiene as applied to school children. The grant was made with the understanding that an equal amount be subscribed from Canadian sources.

* * *

Recent medical publications of interest are *Building Strong Bodies* by Dr. Woods Hutchinson; *The Degenerative Diseases,* by Dr. Lewellys F. Barker and Dr. Thomas P. Sprunt; *Diabetic Diet,* by Doris McHenry and Marjorie M. Cooper; *The Psychology of the Preschool Child,* by Baldwin and Stetcher; and *The Psychology of Emotion,* by Dr. John T. MacCurdy.

* * *

Movies that should not be missed are *Peter Pan,* with Betty Compson in the title part and Mary Brian as an equally able Wendy; *The Last Laugh,* a German production; *The Miracle of the Wolves,* with beautiful winter scenes photographed in the French Alps; *The Lost World,* particularly interesting as the best example yet shown of double film work and the use of small models to represent the monster creatures of the primeval world. A picture of special interest will be released in New York City in the near future, according to announcement. This has been in preparation for several months in Samoa under the direction of Mr. Robert J. Flaherty, producer of *Nanook of the North.* The actors in the picture are all Polynesians, members of what is considered the finest primitive race in the world, and the story is woven about the coming to manhood of the young hero. All the festivities and ceremonials, including the tattooing, are reproduced in detail. The production should be a significant contribution to folklore and manners and customs of primitive peoples.

* * *

A recent statistical report on accidents and their causes and time incidence, states that the peak hour for children's street accidents is five o'clock in the afternoon, comparatively few occurring in the forenoon when both children and drivers are less tired and more alert.

* * *

The Dickens Fellowship is making an appeal for £10,000 to endow the house in Doughty Street where Dickens lived for several years. This house has been until recently a boarding house, but has been bought by the Fellowship and will be opened in the coming summer as a Dickens Museum, containing many relics, books and pictures.

* * *

Both Berlin and Dresden have public consultation centres on marriage relations. The Berlin centre is located in the recently founded Institute for Sexual Science, conducted by Magnus Hirschfeld. Persons contemplating marriage are advised as to health and general personal fitness as to being a mate and parent; sexual and psychic difficulties and questions of child training may also be brought to these centres for advice and discussion.

* * *

Mary Austin, the well known writer on the American Indian, has in *McNaught's Monthly* for March an article entitled Creative Genius and Sexual Freedom which is interestingly written and gives considerable food for thought.

* * *

Pio Baroja, whom many consider the foremost living novelist of Spain, practised for a short time as a village doctor. He tells us in his autobiographical notes, called *Youth and Egolatry,* that he failed three consecutive times in his medical examinations, and, in fact, never succeeded in getting a passing grade until he learned the subjects by rote. He persevered, however, until he received his degree from the University of Madrid. "One day I read—or it may have been one of the family," he casually writes, "that the post of official physician was vacant in the town of Cestona. I decided to apply for the place and dispatched a letter accompanied by a copy of my diploma. It turned out that I was the only applicant, and so the place was awarded to me. . . . I realized in Cestona my childish ambition of having a house of my own, and a dog, which had lain in my mind ever since reading *Robinson Crusoe* and *The Mysterious Island.* I also had an old horse named Juanillo, which I borrowed from a coachman; but I never liked horses. . . . I committed no blunders while I was a village doctor. I had already grown prudent, and my sceptical temperament was a bar to any great mistakes." We can readily see that medicine was not the profession for Baroja. He soon realized this himself and went into the baking business. *Youth and Egolatry* is a very readable, entertaining book.

* * *

The New York State Committee on Mental Hygiene of the State Charities Aid Association has recently issued a leaflet on *First Aid for the Mentally Sick.* It is a plea that patients awaiting admission to hospitals for mental diseases be given the proper care.

* * *

In the June, 1924, issue of *Revue De La Tuberculose,* Paris, the following interesting articles appeared: *La hernie du médiastin au cours du pneumothorax thérapeutique,* by Dr. Dumarest and Dr. Brette; *Valeurs respectives des données manométriques et de la radiologie dans le pneumothorax artificiel,* by Dr. E. Leuret and Dr. P. Delmas-Marsalet; *Présence du bacille de Koch dans le liquide duodénal retiré par tubage,* by Dr. D. Olmer and Dr. Albert Crémieux; *Revue critique des techniques expérimentales, et cliniques applicables à la tuberculose,* by Dr. André Bergeron and Dr. Raymond Letulle. This issue also contains an unusually large review of publications on bacteriology, tuberculin, etiology, pathology and laboratory experiments.

Abstracts from Current Literature

GYNECOLOGY

Erythrocyte Sedimentation Test in Gynecological Diagnosis.—Frida Becher-Rüdenhof (*Wiener klinische Wochenschrift,* May 29, 1924) uses the sedimentation test in every case and is guided by the following conclusions:

1. The sedimentation test is a valuable aid in determining whether the adnexal tumor is of an inflammatory nature, and therefore in the differentiation of neoplastic tumors and tubal pregnancy and other inflammatory salpingitides. It also indicates the presence of a suppurative or inflammatory process in cases where neither the leucocytosis nor the rise of temperature is indicative.

2. This test enables us to determine the presence of complications in the postoperative stage of a disease, such as suppuration, pyelitides and metastases at a time when no other symptoms or signs give such information.

3. The test may be done quickly and easily, particularly because it is not necessary, for practical purposes, to wait for complete sedimentation, as even after a few minutes it shows whether the sedimentation is of type I, II, or III.

The disadvantages of the test are, particularly, that it takes a very long time before the normal sedimentation is restored after a suppurative or inflammatory process. Furthermore, the practical utility of the test is minimized by its excessive sensitiveness, whch gives information about various insignificant processes. By the utilization of only great differences in the test this disadvantage may be eliminated. Nevertheless this test is of diagnostic significance in only a very limited number of disease pictures.

Operation for Retroflexion of the Uterus and for Prolapse.—Felix Franke (*Zentralblatt für Gynäkologie,* June 28, 1924) reports some very good results with the retrouterine suture of the round ligaments drawn through the broad ligaments posteriorly (which are then sutured to the posterior surface of the uterus, so that the uterus rides upon them as on springs). His results are excellent since he sutures the ligaments with silk and makes the patient wear a pessary for twelve days after the operation. A thorough emptying of the intestinal canal should precede the perineal plastic and the stools should then be restricted by keeping the patient on a restricted diet for ten to twelve days.

In cases of prolapse in women of the childbearing age he forms a narrow strip from the fascia of the rectus muscle on both sides, divides the lower base, punctures the rectus muscle and peritoneum on both sides with a forceps and brings the round ligament through this rent and carries the fascial strips under the ligaments through the reduplications of the peritoneum so that they ride upon the strips.

Complete Hysterectomy.—G. C. Reid (*International Journal of Medicine and Surgery,* September, 1924) presents the operative technic in full, and strongly advocates complete hysterectomy in preference to supravaginal ones, for both malignant and nonmalignant disease. In cases of nonmalignant disease postoperative symptoms which occur frequently in supravaginal hyesterectomies, such as leucorrhea, pressure pains, pruritus, etc., do not occur. Many of the infected uteri, if only taken out supravaginally, leave a small focus of infected cervical tissue which keeps up a local irritation or may be the cause of a focal infection and the beginning point for a cervical carcinoma. A small piece of cervical tissue will often cause severe hemorrhages even years after the primary operation.

Excision of Cervix for Endocervicitis.—S. Rottenburg and G. Schwartz (*Surgery, Gynecology and Obstetrics,* November, 1924) state that chronic endocervicitis is an infectious process involving the glands in the cervical mucous membrane, hence any form of treatment other than excision of these glands is only palliative. They recommend the following operative technic:

With the patient anesthetized and placed in the lithotomy position, the cervix is caught with a tenaculum and an incision made on each side beginning at the external os, producing a complete bilateral laceration and making anterior and posterior lips. An incision is then made through the mucous membrane of the portio vaginalis of the upper lip encircling the limits of the eroded area. The mucous membrane of the portio is now pushed back for a distance of a centimetre or more if necessary, to secure a sufficient cuff of the mucous membrane completely to cover over the excised area of cervical tissue. Then, while traction is being made on the upper lip, the entire granular area surrounding the upper portion of the cervical canal is coned out with the scissors. All the infected portion of the canal can thus be excised by direct inspection, and there is no necessity for fearing that either too much or too little of the cervical canal will be removed. A suture of No. II chromic catgut on a full curved needle is placed through the previously liberated flap of vaginal mucous membrane. The suture begins at either angle and pulls up this flap in a submucous stitch, this to continue around until the opposite angle is reached. The angle stitch goes through the entire cervix beginning in the cervical canal and coming out through the flap of mucous membrane. A similar stitch through the other angle completes the upper suture. When this suture is tied, the vaginal flap originally liberated is now inverted into the hollowed out shell of the upper lip of the cervix.

Transposition of the Ovary.—T. Tuffier (*Surgery, Gynecology, and Obstetrics,* October, 1924) says that the living ovary is included in the thickness of the uterine muscle, it projects partly into the uterine cavity, and is studded with corpora lutea. The ovarian tissue contains a voluminous cyst of ovular origin and a considerable number of microcysts with graafian follicles. The uterine mucosa, normal throughout, makes a little polypoid projection at the level of the ovarian relief. On microscopic section the chorion is notably hypertrophic and the glandular convolutions of the mucosa are greatly hypertrophied. One is in the presence then of a moderate adenomatous evolution, circumscribed, and of a still benign appearance.

From these facts it is justifiable to transpose an ovary with its pedicle into the uterine cavity in order to preserve menstruation and the possibility of impregnation in women who have undergone double salpingectomy. Sterility due to lesions which are seemingly benign or unrecognized is so frequent that it opens up a possibility for the application of this operative measure.

New "Uterine Shelf" Operation.—H. L. Smith (*Surgery, Gynecology and Obstetrics,* July, 1924) says that the operation as described is a safe one. The bladder, supported by the uterus as a shelf, is permanently retained in its corrected position. The symptoms, whether due to the dragging down or to the irritation of the bladder, are completely relieved in at least ninety-five per cent. of the cases. The best results are obtained, as would naturally be supposed, when the uterus is supported by some sort of intra-abdominal operation. A thorough repair of a torn or relaxed perineum and any complicating rectocele is quite essential. A large measure of relief can be expected even in those cases in which the condition of the patient does not warrant opening the abdomen. The fixation of the uterus as described not only does not in itself produce any discomfort, but many patients have an unexpected feeling of well being. Advanced age seems no bar to the operation.

Surgical Treatment of Displaced Uterus and Vagina.—W. Stoeckel (*Zentralblatt für Gynäkologie,* June 28, 1924) uses the following technic in the various displacements of the uterus and vagina:

In cases of uncomplicated retroflexion of the uterus, when there is backache, hemorrhage and secretion as a result of circulatory congestion, he uses the Fritsch pessary and, possibly, the Alexander-Adams operation; if the retroflexion is fixed the changes in the adnexæ should be treated—the chronic type with diathermy. The best operative procedure is the Baldy-Franke operation.

In vaginal plastics he uses as a routine interrupted sutures in place of the isolated suture of the levator, which is an unanatomical procedure, and also the "deep" Lawson-Tait method, less buried, but deeper and more penetrating sutures. The interposition operation gives good results when the anterior vaginal wall is sufficiently stretched. Fixation to the promontory gives equally good results even though the ultimate results are not permanent. The tendency to ileus is avoided either by fixation of the entire uterus posteriorly or by the opposite procedure of forced anteflexion of the body of the uterus by vesicofixation.

Stricture of Female Urethra.—A. S. Pugh (*Annals of Surgery,* May, 1924) presents several cases with the following conclusions: Stricture of the urethra in women is common. The principal cause is a gonococcus infection. The pathology is quite similar to that of urethral stricture in the male. Its most common location is at the external meatus. Most common symptoms are, frequency, urgency and dysuria. The diagnosis may always be established by olivary tip, or bulbous bougies. Prognosis is good in soft infiltrations, while in hard infiltrations it is doubtful. Treatment is best carried out by the use of gentle dilatation. Operative procedures are always to be avoided if possible.

Joint Affections Due to Ovarian Insufficiency.—C. Menge (*Zentralblatt für Gynäkologie,* July 26, 1924) calls attention to the frequently occurring involvement of the joints of the knee and the more rarely occurring involvements of the shoulder, fingers, or the cervical vertebræ, with stiffness or pain, or both. These are often induced by röntgen exposures or during the menopause, associated with amenorrhea. The arthropathy is usually symmetrical and persistent, but it disappears in time without any treatment. This disease picture has been described as bilateral, symmetrical, senile arthritis, but it is really due to insufficiency of the ovary after ovariotomy. The treatment recommended is salt water bathing.

Erythrocyte Sedimentation Test, Especially in Certain Obstetrical and Gynecological Conditions.—O. Burckhardt-Socin (*Schweiberische medizinische Wochenschrift,* July 31, 1924) states that the blood picture must always be taken into consideration in the proper estimation of the rapidity of the sedimentation of the erythrocytes, because anemias, *per se,* cause acceleration of this test. The author carried out this test with special attention in very early cases of osteomalacia and found it positive except in two cases, in which an abnormally high erythrocyte count retarded the test. In these cases of beginning osteomalacia it is important to look for an increase in the blood calcium. Both of these symptoms receded on the administration of adrenalin, as well as the clinical picture.

Treatment of Fibroids of the Uterus.—Cuthbert Lockyer (*British Medical Journal,* June 14, 1924) believes that in fifty-five per cent. of all fibroids of the uterus no treatment whatever is needed. In the remaining forty-five per cent., thirty-five per cent. require removal (myomectomy), leaving ten per cent. to be dealt with by radium. This is equivalent to stating that the field for operation is from three to four times as great as that for radiotherapy. The author considers the use of radium as an alternative to hysterectomy. Surgery and radiotherapy may be run tandem—but to radiotherapy is assigned a very subsidiary status.

Differential Diagnosis of Pelvic Exudate and Pelvic Tumors.—Hermann Jentter (*Zentralblatt für Gynäkologie,* May 3, 1924) recommends the use of percussion of the anterior spine of the ilium for the purpose of differentiating pelvic exudate and pelvic tumors. His experiences lead him to believe that the following conclusions are justified: 1. Percussion of the anterior spines of the ilium normally give a high tympanitic tone. 2. Intraperitoneal exudates, tumors of the major and minor pelvis situated intraperitoneally and adnexal tumors do not change the percussion note of the spines of the ilium. 3. Exudates and infiltrations of the pelvic cellular tissues (parametritis, pelvic cellulitis, paratyphlitis, hematoma of the broad ligament pelvic cancer, etc.) produce a lowered percussion note which may even reach absolute dulness.

Adenomyoma of Rectovaginal Septum.—M. T. Goldstine and S. J. Fogelson (*Surgery, Gynecology and Obstetrics,* June, 1924) present a series of cases with the following conclusions: Hematomata or chocolate cysts of the endometrial type may develop anywhere outside of the uterus provided the normal ovarian function is present to act as a stimulus. In all of the cases reported there was definite evidence of inflammation varying from a chronic inflammatory process to that in which newly formed granulation tissue was the predominant characteristic. The growth in one case apparently was not a transplant or outgrowth from the uterus but appeared to be a developmental rest because of its isolation and the ease with which it could be enucleated. Later the presence of plasma and mast cells indicated chronic inflammation. These growths are not only interesting from an etiological and histological viewpoint but are of marked clinical significance. Their removal has relieved many distressing symptoms. From the study of this group of cases together with others now under observation, the authors feel that the preponderance of evidence is greatly in favor of R. Meyer's etiological theory that these growths are of inflammatory origin, notwithstanding the fact that the presence of tissue in situations where it is not normally found may cause an aseptic inflammatory reaction.

Blood Platelets in Gynecological Hemorrhages.—Walter Vogel (*Zentralblatt für Gynäkologie,* January 19, 1924) found that the total number of the blood platelets and the relationship between the large and the small forms are normal in gynecological hemorrhages, especially in the so-called essential hemorrhages. The only exception is the rare cases of thrombopenia, in which there is a high grade of diminution in the number of the blood platelets and with it a severe disturbance of the coagulating system of the blood.

Uterine Secretion: Brief Investigation of Its Nature in the Human Being.—Isidor Kross (*American Journal of Obstetrics and Gynecology,* March, 1924) is led to the following conclusion by his experiments: Hematocolpos fluid is thoroughly mixed with the uterine secretion that contains a fibrinolytic ferment similar to that present in the rat, and its fluid nature is due to the action of this ferment. Similarly it can be stated that in the normal individual, the menstrual blood is fluid and it does not clot subsequent to its escape from the uterus and vagina, as a result of the activity of this ferment. Where the menstrual fluid is composed of more or less clotted blood in an individual whose internal genitalia are not the seat of abnormal anatomical changes, it seems proper to conclude in that case that there is a deficiency of the fibrinolytic or thrombolytic ferment.

Etiology of Air Embolism Originating in Uterine Veins.—Isidor Amreich (*Zentralblatt für Gynäkologie,* March 1, 1924) asserts that from the anatomical viewpoint the diameter of the pelvic veins depends upon the condition of the surrounding fasciæ and muscles. They need not be excluded from the external world, but if after delivery large amounts of air enter the cavity of the uterus as a result of any therapeutic manipulation and if then a contraction of the levator ani as well as elevation of the pelvis takes place, there may be a suction effect owing to the dilatation of the lumina of the veins by fixation. The veins involved are the sacrouterine plexus, the hypogastric and the uterine veins.

OBSTETRICS

Basal Metabolism Before, During, and After Pregnancy.—Irene Sandiford and Theodora Wheeler (*Journal of Biological Chemistry,* December, 1924) give complete data on the respiratory metabolism of a normal woman before, during, and for six lunar months after pregnancy. The results agree with those of other investigators in that there is a definite increase in the total heat production during the latter part of pregnancy, in this case beginning with the eighth month, and gradually increasing to the tenth lunar month, when the otal calories for each hour were twenty-five per cent. greater than before conception. There was no increase in heat production during lactation, but rather a slight decrease, probably because of the less active life. There were slight daily irregular variations in the heat production after the reestablishment of menstruation, but none which can be accredited to its influence.

Treatment of Puerperal Eclampsia.—Beckwith Whitehouse (*Lancet,* May 31, 1924) treats puerperal sepsis according to three general principles: 1. Treatment must be started at the earliest possible moment. 2. It is unwise to differentiate between sapremia and septicemia, or again to depend upon the superficial characteristics of the uterine lochia. 3. The patient shall be in surroundings where efficient nursing is possible, and where it is carried out by a properly trained nursing staff.

The local treatment includes swabbing of the vagina, cervix and uterine cavity with large quantities of hypochlorite solution. The uterine cavity is then lightly curetted and a large double drainage tube is introduced into the uterine cavity and carried to the fundus of the organ. The uterus is irrigated with the hypochlorite solution every two or three hours. Curettage in the constant presence of a powerful antiseptic has never done any harm in the author's experience. Curettage must be light and it must be associated with constant irrigation of the uterus; if heavy and employed alone it is undoubtedly dangerous.

The general treatment includes: 1, serum therapy; 2, autogenous vaccines; 3, intravenous acriflavine; and 4, a concentrated and nutritious diet and a liberal allowance of alcohol. In severe cases a one in 250 solution of acriflavine in normal saline solution is given intravenously in doses of twenty c.c. morning and evening.

Regulation of Placental Respiration.—Walther Schmitt (*Zentralblatt für Gynäkologie,* February 23, 1924) reports the results of his transfusion experiments on the surviving placenta. With a very slight content of oxygen in the fetal blood there develops an incomplete oxidation in the tissues and resulting metabolic products and a concentration of the hydrogen ions. These in turn produce a dilatation of the bloodvessels and consequently an increased accession of oxygen, complete oxidation in the tissues, and contraction of the bloodvessels. This is demonstrated by the visible contraction of the bloodvessels after a perfusion with an abundance of an oxygen containing Ringer solution and the relaxation of the bloodvessels under other conditions. The oxygen shows no special effect upon the placental bloodvessels.

Dietary Requirements for Reproduction.—Barnett Sure (*Journal of Biological Chemistry,* December, 1924) presents evidence to show that ether extracts from yellow corn, wheat embryo, and hempseed contain an organic factor, called vitamine E, essential for reproduction. Fertility was obtained on rations carrying commercial olive oil and cottonseed oil, while it was not obtained on rations containing commercial linseed and cocoanut oils. Evidence is brought forth to corroborate the theory that the water soluble B vitamine plays a hitherto unsuspected tremendous role in lactation. Skimmed milk powder, fortified with .2 per cent. ferric citrate, when incorporated to the extent of fifty per cent. in a ration, thus furnishing 17.5 per cent. protein, furnished an excellent quality and sufficient quantity of amino acids for the whole cycle of reproduction.

Plasma Protein Variations in Normal and Toxemic Women.—E. D. Plass and L. Jean Bogert (*Bulletin of the Johns Hopkins Hospital,* November, 1924) found that in twenty-two healthy nonpregnant women in the childbearing age the plasma proteins varied from 6.45 to 7.83 per cent., with an average of 7.04 per cent. During normal pregnancy, the plasma proteins start to fall during the third lunar month, or occasionally even before then, and decrease gradually to a minimum during the sixth month, after which there is a slow rise during the latter months of pregnancy, with the values at the tenth month still somewhat below normal. A further sharp rise occurs at the time of labor and is continued into the first day postpartum, but in the next twenty-four hours the proteins suffer an abrupt decrease, which is maintained for three or four days and is followed by a rapid rise to normal at the end of the first week. Patients with the toxemias of pregnancy have similar variations, but the dilution is more marked, depending largely on the extent of the clinical edema.

Insulin Treatment of Vomiting of Pregnancy.—W. Thalhimer (*Surgery, Gynecology and Obstetrics,* August, 1924) reports three cases and remarks upon the success of insulin treatment with them. He points out several essentials of the insulin and glucose treatment. He says that only those cases should be treated with this method in which there is a severe acidosis. This should be determined, first by demonstrating large amounts of acetone and diacetic acid in the urine, or by demonstrating a blood alkali reserve of forty-five or less. When it has been determined that severe acidosis is present, one thousand cubic centimetres of ten per cent. glucose solution should be slowly given intravenously. The time consumed in giving this amount is four to five hours. One hour after the intravenous infusion has been running, twenty units of U. 20 iletin (that is one cubic centimetre) should be given hypodermically. An hour later ten units of U. 20 iletin (one half cubic centimetre) is given hypodermically. No patient has ever had an insulin reaction after these doses.

In the event of marked improvement in the patient's general condition and of the acidosis not occurring in twelve hours, the procedure outlined above should be repeated, and it is better never to give a dose of insulin to a nondiabetic patient without at the same time administering a proper amount of glucose, either hypodermically or intravenously, since one can only be sure of absorption of the glucose when it is administered by one of these two routes.

While the glucose is running, the patient should not be left alone for a minute and should be seen frequently by a physician; and a sterile hypodermic syringe and a bottle of adrenalin should always be available in the patient's room. If an insulin reaction occurs, from three to five minims of adrenalin should be given hypodermically at once, followed by more glucose intravenously or by carbohydrate food by mouth. If in your clinical judgment the patient is greatly dehydrated at the beginning of the treatment, give two thousand cubic centimetres of one per cent. glucose solution instead of one thousand cubic centimetres of ten per cent.

Renal Tuberculosis During Pregnancy.—W. E. Stevens (*Surgery, Gynecology and Obstetrics,* December, 1924) presents a series of cases that the conclusion may be drawn that pregnant women stand nephrectomy well and that this operation for renal tuberculosis is no more serious for mother and child than nephrectomy because of other pathological conditions of the kidney during pregnancy. Following the removal of a tuberculous kidney tuberculin should be administered, the urine examined at frequent intervals for a considerable period of time, and the patient kept under observation. Pregnancy is permissible if the remaining organ is free from tuberculosis and functioning normally after a period of two or three years.

Fibroids in the Puerperium.—E. W. Fischmann (*Surgery, Gynecology and Obstetrics,* September, 1924) finds that fibroid tumors in the puerperium may cause serious complications, frequently a febrile course. They themselves may suffer changes during gestation and labor and these may progress and even be augmented by secondary infection during the puerperium. When a woman with a fibromyomatous uterus becomes pregnant and goes to term, Cæsarean section with an immediate myomectomy or hysteromyomectomy is the operation of choice. When the myoma is not discovered until during labor or in the puerperium, conservatism should be practised as long as possible.

Syphilis and Obstetrics.—E. Klaften (*Zentrablatt für Gynäkologie,* August 30, 1924) remarks that the obstetrician can make an early diagnosis of syphilis in the newborn in one of three ways: 1, by serological investigation of the blood from the umbilical cord; 2, by the demonstration of spirochetes in the fetal end of the umbilical cord, and 3, by the demonstration of leucocytic infiltration in the umbilical cord and changes in the umbilical vessels, as well as by analogous changes in the placenta. In the absence of a febrile or other chronic disease, as tuberculosis of the mother, the changes in the umbilical cord are to be considered as characteristic of syphilis, especially in association with a positive reaction of the serum from retroplacental blood. These three criteria are signs of syphilitic involvement of the newborn and require antisyphilitic treatment of the child even in the absence of syphilitic manifestations. Furthermore, those children that are born of untreated latent syphilitic mothers, or of mothers who became infected during pregnancy and have been treated only after the appearance of secondary symptoms or in the seropositive stage, should be given prophylactic treatment.

Colon Bacillemia in Pregnancy Without Pyelonephritis.—A. Lemierre and E. Rivalier (*Bulletins et mémoirs de la Société médicale des hôpitaux de Paris,* April 3, 1924) report the case of a woman five months pregnant, in whom an infection suddenly developed, which persisted for ten days and was characterized by repeated febrile movements with severe chills and sweats, occurring several times daily, with a temperature range of 37.4 to 40° C. and intense headache. A blood culture showed colon bacilli. At no time was there pain in the kidney region. The urine never became purulent, but microscopically showed many colon bacilli, granular casts, a moderate number of leucocytes and slight albuminuria. Recovery followed without specific treatment. Stress is laid on the frequent chills and fever as a characteristic feature of colon bacillus infection. As the woman had had a marked fecal accumulation on admission, the bacillemia is believed to have originated from the bowel. In spite of the intensity and relatively long duration of the infection, no severe localization of it in the kidney or its pelvis took place, although the germs passed through the renal barrier and appeared in the urine. The case shows that colon bacillus septicemia in pregnancy is not necessarily followed by renal involvement.

Nonprotein Nitrogen Retention During Eclampsia and Allied Conditions. The Blood Nitrogen Curve in Normal and in Toxemic Pregnancies.—E. D. Plass (*Bulletin of the Johns Hopkins Hospital*, November, 1924) studied the blood of ten nonconvulsive toxemic and seven eclamptic patients, and of seven normal women during labor and the early puerperium, in order to determine the normal variations. Analyses of 182 samples of whole blood and plasma were made. The results of these experiments are grouped in a series of tables. It is concluded that after delivery in normal patients there is a tendency for certain nonprotein nitrogen fractions of the blood to rise, and for the protein of the blood plasma to fall; whereas in patients suffering from the late toxemias of pregnancy these changes are almost invariably accentuated, their extent being determined largely by the severity of the disease. In the latter group, similar but slighter changes can follow medicinal treatment without delivery, a fact which is taken to mean that physiological puerperal alterations cannot be held responsible for the changes, although they may augment the variations appearing when improvement is induced by delivery. By exclusion, a tissue retention process is suggested as explaining the changes noted, although the effect of renal insufficiency is not to be disregarded.

Significance of Ocular Changes Occurring in Association with Preeclamptic Symptoms. — Lloyd Mills (*American Journal of Obstetrics and Gynecology*, March, 1924) asserts that the eyes are involved in more than ninety per cent. of all cases of pregnancy as a result of the physiological enlargement of the pituitary gland, which causes different degrees of contraction of the visual fields by pressure upon the optic commissure and tracts. In the more marked cases more or less retinal venous stasis probably arises from the same origin. A temporary but decided loss of central as well as temporal vision, amounting to practical blindness at times, has also been noted in occasional cases, heretofore classed among the toxemias of pregnancy. No gross renal blood or obstetrical pathology is found in such cases, which probably represents an acute obstructive renal stasis and edema, or the direct effect of relatively excessive pressure upon the optic nerve system, or a combination of these factors. The symptoms in these cases, hitherto assumed to be preeclamptic, of headache, nausea and vomiting, and epigastric and colonic distress, occur often without renal or hepatic disturbance. They probably arise from the local intracranial pressure of the hypertrophied pituitary as well as from greatly increased pituitary function. The separation of symptoms, hitherto considered to be preeclamptic, into those of pituitary origin and those arising out of a genuine toxemia of pregnancy, and an accurate knowledge of the relative importance of each, will be accomplished in a large measure, by systematic examinations of the visual fields and eye grounds of all pregnant women who suffer late in pregnancy from headache, nausea and vomiting, abdominal distress and renal or hepatic disturbance.

Hydrostatic Repositor for Prolapse of Umbilical Cord.—D. Monash (*Surgery, Gynecology and Obstetrics*, July, 1924) offers a new selfretaining repositor which he has used with success in several cases. This repositor is made of fabric reinforced rubber and consists of a hollow elliptical ring and a long tail tube. On one side of the oval is a small pocket to facilitate introduction. The outside measurements of the oval are eight by six centimetres, the central opening being two centimetres less in all diameters. The tube is forty-five centimetres long. The fluid capacity at full distention is about forty cubic centimetres. Distended, the repositor withstands a pressure of three hundred milligrams mercury, which is far above the compressor points of a uterine contraction.

The method of introduction is as follows: With the patient in the usual position with the pelvis well elevated the first step in reposition of pulsating cord is to introduce the flat, collapsed repositor into the vagina and with the fingers or forceps draw the prolapsed loop through the opening in the oval. Then directed by the internal fingers the tip of the uterine sound or uterine forceps enters the pocket on the oval or the upper part of the oval is grasped by the forceps and the second step is the carrying of the repositor and engaged loop into the uterine cavity above the presenting part. The third step constitutes the distention of the repositor with sterile water and tying or clamping the tube. The probe or forceps is now removed and the distended repositor with the trapped cord remains in the space between the small parts and the uterine wall.

The tube when fully distended is still pliable and offers no resistance to the advancing head. The distended repositor with the loop of the cord within has the virtue of mass formation, providing a point of fixation similar to that of a small part upon which the cord can be looped. This is further augmented by the crossing of the planes of the distended repositor and the retained loop. The success recorded, in several instances in which repositors were improvised out of a piece of sponge or folds of gauze, was apparently due to this mass immobilization. These are important factors in selfretention. Failure in manual reposition is indeed caused by this very lack of fixation en masse for the mobile loop of the cord if not carried over a small part of the fetus follows the pathway of the withdrawing fingers and is expressed before the head can occlude the lower uterine segment.

No metal or other stiffening substance is incorporated in the rubber repositor, first, because it is desirable to avoid the danger of injuring the uterine wall, placenta or child and second, because the collapsed repositor is more easily introduced through the undilated cervix and when distended is sufficiently rigid for safe retention within the uterus.

Blood Chemistry During Pregnancy.—H. J. Stander (*Bulletin of the Johns Hopkins Hospital*, May, 1924) bases this paper on the results of routine blood analyses carried out upon fifty-three patients. In the analysis, conditions obtaining in normal pregnancy, as well as in the toxemias of pregnancy, have been analyzed. In normal pregnant women there was a definite tendency toward lower values for both nonprotein nitrogen and urea nitrogen, the averages being 28 and 12.48 mg. to 100 c.c. respectively, as compared with 32.3 and 18.5 mg. to 100 c.c. in nonpregnant women. In cases of persistent vomiting there was an increase in the nonprotein nitrogen and uric acid in the fairly severe cases, with a return to normal as the patient improved. In nephritic toxemia, there is a definite increase in the nonprotein nitrogen, the blood urea nitrogen and uric acid. In eclampsia, the nonprotein nitrogen figure is not greatly altered, but there is a decrease in the urea nitrogen. The uric acid content is markedly increased, while the carbon dioxide combining power remains fairly normal.

Cæsarean Technic.—G. S. Foster (*Surgery, Gynecology and Obstetrics*, May, 1924) presents the following operative technic, stating that the success of Cæsarean section is in direct ratio to the perfection of the technic, and that the procedure herein described has for many years proved satisfactory in every detail.

No narcotic is given to the mother preoperatively as it has seemed markedly to influence early reactionary activity on the part of the child. The child was cyanosed and did not breathe as early, at times requiring artificial respiration.

All Cæsarean patients are fully prepared and draped ready for the incision before any anesthetic is given. For all cases up to the time of delivery of the child and placenta we have used gas oxygen only. This is done to assist the child further in becoming active in the reaction immediately upon delivery. For gas oxygen does not seem to influence the child in any way. Shortly after the gas oxygen is started the anticipated line of incision is thoroughly anesthetized with a half of one per cent. novocaine solution, each layer being carefully covered.

Just as the incision is begun thirty minims of ergotol with one cubic centimentre of pituitrin is injected deep in the thigh muscles.

A rather long median incision extending from the umbilicus to the pubic crest is preferred, as this permits of plenty of room for quick and accurate action. The skin, fascia, muscle, and peritoneum are thus quickly incised. As soon as the abdominal cavity is opened towels moistened with warm saline solution are dropped over the lateral edges of the wound cutting off any danger of apposition of these parts with the uterus or exposure of the intestines. These towels are carefully anchored at frequent intervals about the wound.

The hand is then introduced into the abdominal cavity and the position of the uterus quickly surveyed to make sure that the median line of the uterus is in the same plane as the median line of the body.

The uterus is then incised. A previously unused scalpel is employed for this, as was also done when incising the

peritoneum. The author prefers a moderately high incision believing that it permits of more accurate and quick delivery of the child. No attention is paid to constricting the vessels of the broad ligaments. As the amniotic sac bulges it is quickly opened, divulsed with the fingers, one index spreading each angle of the opening.

The presenting part of the child is then gently grasped and the child delivered, cord clamped and cut, and the baby turned over to the pediatrist for immediate care. The placenta is then carefully delivered by gentle separation of the cleavage line with the pulpy part of the finger tips. It is made sure that every part of the placenta is delivered.

So far in the operation there is very little loss of blood, not over half an ounce. Immediately upon delivery of the placenta the uterus contracts under the influence of the ergotol and pituitrin and all oozing ceases. Clean towels are then quickly draped about the wound and anchored.

The uterus is quickly brought out onto the clean field and all areas mopped dry and the suturing begun, the assistant beginning at the upper extremity and the operator at the lower extremity of the uterine incision, using a long, straight, cutting pointed needle threaded with No. 2 chromic catgut. These sutures are passed through the entire thickness of the uterine wall with the exception of the mucosa. As soon as the sutures are passed they are tied and held both below and above by a second assistant. Thus the uterine opening is held taut and closed. These sutures are passed about a half inch apart and as each succeeding suture is tied and held below and above, the preceding ones are cut. In this way rapid and accurate progress can be made while any bleeding is noticeable by its absence.

After completing this line of sutures, three mattress sutures include both sides of the incision and when tied infold and cover over the first line of sutures and the incision. By so doing the first line of sutures is buried, the suture line strengthened and the uterine wall reinforced.

On completion of the mattress sutures all areas are fully dried, special attention being given the space of Retzius and the vesicocervical superior plane. The uterus is then replaced in the abdomen. Following this, the peritoneal edges are quickly picked up at various points and made ready for closure. In closing the peritoneum a continuous mattress suture of No. 2 chromic catgut is used locking each third stitch by a half hitch. By this method rather than by suturing the raw edges of the peritoneum together, the marginal area for about a half inch is sutured to the uterus about the infolding line of the latter. By so doing the suture line of the uterus remains freely exposed and the peritoneum adheres to the uterine wall about it. This suture is made for two purposes. It permits of the formation of an improvised, accessory, suspensory ligament for the uterus and provides for subsequent Cæsarean operations without the direct opening of the abdominal cavity. The abdominal cavity becomes so walled off that subsequent Cæsarean sections are extra abdominal in so far as exposing the intestines or abdominal cavity is concerned. Subsequent Cæsarean sections in cases closed in this manner warrant the continuation of the use of this closure of the peritoneal cavity.

The fascia is closed by a reverse lapping stitch and the skin closed by three through and through silkworm gut sutures and a continuous skin edge linen suture. Just before closing the skin the wound is rinsed with sterile water and after being carefully dried a culture is always made before the skin edges are brought together. This culture taking is carried out not only in Cæsarean but in all closures of previously clean wounds merely as a check upon our asepsis. In Cæsarean cases we also culture the mucosa of the uterus.

Some patients will strain after the child is delivered and will then, but never before this time, require a little ether vapor mixed with the gas oxygen.

In cases where vaginal examination has been made we prefer to leave a short inch gauze wick drain through the cervical canal to the vagina. This is removed on the third or fourth day. If multiple vaginal examinations have been made, and especially by more than one physician; we leave a cigarette drain, which is removed the fourth day, in the lower angle of the abdominal wall incision extending down to the vesicocervical plane and space of Retzius.

Special emphasis is placed on the method of reinforcing the uterine incision and the establishment of an extraperitoneal route for subsequent Cæsarean sections.

BLOOD AND LYMPH GLANDS

Effect of Administration of Calcium Salts on Inorganic Composition of Blood.—Harald A. Salvesen, A. Baird Hastings, and J. F. McIntosh (*Journal of Biological Chemistry*, June, 1924) undertook the present investigation to study the effect of oral and intravenous administration of calcium salts on the acid-base equilibrium and the inorganic constituents of the blood, and to attempt to trace the fate of intravenously introduced calcium chloride. The experiments were performed on normal dogs, and on two nephritis patients, to whom calcium salts were administered as therapeutic agents to produce diuresis. The results show that the ingestion of calcium chloride may produce a severe, uncompensated acidosis in dogs and human subjects, due to a replacement of HCO_3 by Cl in the blood, and as a result of absorption from the alimentary tract of the Cl of $CaCl_2$ without the Ca. An actual loss of base from the blood and a failure to adjust the CO_2 tension to the lowered bicarbonate was also observed. Calcium lactate, given orally, produced no characteristic change in the blood in two cases of Bright's disease with low blood calcium and low protein. The intravenous administration of 0.5 to 1.10 gm. of calcium chloride had no effect on the acid-base equilbrium of the blood, but caused a moderate rise in the phosphates. The injected calcium left the blood in three to six hours. There was no increase in the daily excretion of calcium in urine and feces for six days after the injection.

Further Studies on Blood Grouping.—C. G. Guthrie and J. F. Pessel (*Bulletin of the Johns Hopkins Hospital*, February, 1924) state that temperature is an important factor in isohemagglutinin reactions. Agglutinative titre is higher and agglutination occurs more rapidly at icebox than at body temperature. More isoagglutinin is required to cause clamping at body than at icebox temperature. Thus an amount of agglutinin sufficient to cause marked agglutination in the icebox may escape recognition in tests made at 37° C. or at room temperature. Isohemagglutination tests should be carried out at a constant temperature. That of 15° C. is recommended. Time is also a factor to be considered in agglutination by diluted sera. It is probably of similar importance in tests with weak undiluted sera. Preparations that have stood from one to two hours are considered within the limit of safety.

Variations in the Acid-Base Equilibrium of the Blood in Disease.—Victor C. Myers and Lela E. Booher (*Journal of Biological Chemistry, April, 1924,*) reports the pH of venous blood plasma of normal individuals at rest and at sea level between 7.35 and 7.43 regarding figures below and above these ranges as definitely abnormal. The data in two hundred cases support the conception, advanced by Van Slyke, and conditions of acid-base variation have been met which fall into each of the nine areas described by him. Alkalosis is said to be a condition often overlooked, and sometimes confused with acidosis by the clinician. It may occur after the administration of sodium bicarbonate, following x ray treatment, prolonged periods of persistent vomiting, in the course of fevers, and possibly in gall bladder disease. Contrary to the opinion formerly held, patients may live for a comparatively long period with low pH values.

Clinical Significance of Pathological Changes in Hodgkin's Disease.—Dougles Symmers (*American Journal of the Medical Sciences*, March, 1924) divides this disease into two groups of cases: 1. Those in which the changes are confined to the lymphoid structures, i. e., to the lymph nodes proper and to residual lymphoid foci in the spleen, in the walls of the portal vessels, and in the interstitial tissues of the lungs, kidneys, bone marrow, subcutaneous tissues, and serious membranes. 2. Those with the same sort of changes in the same localities, but with in addition infiltration and destruction of muscles, bloodvessels, serous and mucous membranes, erosion of bone and mechanical replacement of solid viscera. It appears that we must relinquish the conception that Hodgkin's disease is most commonly shown by enlargement of the lymph nodes of the neck. In the series studied by Symmers the disease displayed itself as an enlargement of the abdominal lymph nodes, or of the abdominal and thoracic nodes in combination ten times more frequently. It is a fact of clinical value that enlargement of the axillary nodes is secondary to involvement of the thoracic or cervical nodes, and that enlargement of the inguinal nodes is secondary to involvement of the abdominal nodes. These observations suggest that the provocative agent does not enter through the skin, but

exclusively through mucous membranes, and probably only through the mucous membranes of the gastrointestinal tract, although the respiratory tract cannot be excluded. It is significant that in this series there was not a single case in which enlargement of the peribronchial nodes could be implicated other than as an associated phenomenon, never as the predominant focus. The brunt of attack is borne by the lymph nodes of the abdomen, thorax, neck, axilla and groin and by the auxiliary lymphoid system, while the lymphoid follicles which lie in the submucosa of the gastrointestinal, respiratory and urinary tracts practically always escape intact. Evidence is offered to show that Hodgkin's disease may reveal itself the most prominently in organs other than the lymph nodes, that enlargement of the spleen, thymus, or liver may be the predominant feature, the associated lymph-node enlargements assuming a place of secondary importance.

According to Symmers this disease is divisible clinically and anatomically into five groups: 1. Hodgkin's disease of the regional lymph nodes: a, predominant involvement of the abdominal nodes; b, of the abdominal and thoracic nodes in combination; c, of the nodes of the neck. 2. Predominant involvement of the thymus. 3. Predominant involvement of the spleen. 4. Predominant involvement of the liver. 5. a, Axillary involvement (sequential to cervical or thoracic lymph node enlargement); b, inguinal involvement (sequential to abdominal lymph node enlargement).

The skeletal muscles may be extensively destroyed by tissue of the same sort as that in the lymph nodes. The bone marrow may react in at least two different ways: It may show hyperplastic changes, particularly in the eosinophiles and eosinophilic myelocytes, or it may be replaced by tissue of identical composition with that of the diseased lymph nodes. Evidence is presented which tends to show that in the reactions in the lymph nodes and in the bone marrow there is a certain parallelism between Hodgkin's disease and chronic myelogenous leucemia. This suggests that the two are fundamentally related and that they probably represent different quantitative responses to the same type of provocative agent. Hodgkin's disease is an affection of the hemolyticopoietic apparatus. Its histogenesis is determined 1, by preliminary hyperplasia of lymphoid cells in various parts of the body, and by the discharge of mononuclear and multinuclear giant cells from the bone marrow, with or without eosinophiles and eosinophilic myelocytes, and their arrest by the hyperplastic lymphoid depots in pursuit of their function as filters, the fibroplastic reaction in the recipient tissues representing a mechanical process designed to support the excess of cells by which they are burdened.

Chemical Blood Analysis in Asthma, Hay Fever and Allied Conditions.—Maximilian A. Ramirez, A. V. St. George, and R. L. Moses (*Journal of Laboratory and Clinical Medicine*), determined the nonprotein nitrogen, sugar, and plasma chlorides in forty-one patients with asthma, hay fever and allied conditions before starting treatment with either vaccines, food protein and diet, pollens, etc., and after its completion. In these conditions there was a relatively high plasma chloride content of the blood, and to a less extent, a rise in the sugar and nonprotein nitrogen, the latter two especially in the nonallergic type of asthma cases with a long standing associated bronchitis. A definite statement that treatment caused a marked change in the chemical constituents of the blood is impossible, but the tables show some diminution in the constituents.

Histopathological and Blood Studies with Silver Salvarsan.—C. W. Hooper and C. N. Myers (*Journal of Laboratory and Clinical Medicine*. December, 1924) undertook this work to study the retention and elimination of silver following repeated intravenous administration of silver salvarsan. No evidence was obtained to show that repeated intravenous administration of silver salvarsan to rabbits in doses of ten mg. to the kilogram (equivalent to a clinical dose of 0.6 gram) or 66.7 milligrams to the kilogram (equivalent to a clinical dose of 4 grams) produces any severe tissue alterations. In all the rabbits that received repeated intravenous injections of 66.7 milligrams silver salvarsan to the kilogram the silver granules were deposited in the Kupffer cells of the liver, rarely in the liver cells proper, and frequently in extracellular groups between the liver cell columns and in the periportal connective tissue. The bone marrow in proportion to its size contained even more silver than the liver, and silver granules were also found in the spleen pulp, interstitial tissue of the kidney, and the tunica propria of the stomach and small intestine. In regard to the effect on the blood, anemia was not produced in any of the eight experiments. The majority of the animals showed a gradual increase in hemoglobin and red blood cells. The white blood cells and differential counts remained within normal limits.

Splenomegaly with Hyperleucocytosis.—M. E. Alexander (*Journal of Laboratory and Clinical Medicine*, September, 1924) reports the clinical and pathological findings of a case of splenomegaly, resembling the cases described in the literature in the past few years as "splenomegaly with hyperleucocytosis." The cases described by other authors are reviewed, and a detailed postmortem study of Alexander's case is given. From the evidence presented, he does not believe that there is any justification to consider these cases as a new clinical entity, but rather he classes them as atypical forms of myelogenous leucemia.

Factors Concerned in the Polycythemia Produced by the Subcutaneous Injection of Epinephrine.—Charles W. Edmunds and Erwin E. Nelson (*Journal of Experimental Medicine*, January, 1925), state that the subcutaneous injection of epinephrine in doses of one mg. to the kilo brings about a polycythemia, an increase in reticulocytes, and an increase in young forms of polymorphonuclear leucocytes. The polycythemia is no doubt partly a concentration phenomenon, but the presence of these young cells in increasing numbers is believed to be evidence that there is at the same time a discharge of cells from the bloodforming organs, due to the effect of the drug upon them. A similar effect is obtained by continued stimulation of the peripheral ends of the cut sciatic nerves in the curarized animal.

Nontuberculous Granulomatous Lymphadenitis.—G. H. Hansmann (*Surgery, Gynecology and Obstetrics*, July, 1924) denominates this disease a clinical and pathological entity. The article deals with a nontuberculous granulomatous lymphadenitis which is a clinical and pathological entity. The infective agent enters through the skin or mucous membrane and leaves a very small, nonpainful lesion which may persist for several months. The accompanying lymphadenitis is extremely chronic, finally leading to periadenitis and sinus formation. The two diseases that give difficulty in diagnosis are tuberculous lymphadenitis and climatic bubo. The only way to rule out tuberculosis with certainty is by animal inoculation. Climatic bubo is by some authors considered an identical disease. There are some striking differences in the clinical history and pathology in these two diseases.

The bacteriological procedures and animal inoculation have yielded no suggestion as to the etiology. As far as is known the material is not pathogenic for animals other than man. Surgery, which aims at the removal of the affected glands and periglandular tissue when involved, leads to prompt recovery.

The Blood and Blood Picture at High Altitudes.—W. Knoll (*Schweizerische medizinische Wochenschrift*, January 31, 1924) finds that the granular and intermittent flow of blood in the capillaries occurs both at low and at high altitudes to the same extent; it actually increases the number of erythrocytes, but it can be prevented by external measures, whereupon the number of erythrocytes is diminished. The increase in erythrocytes and of hemoglobin and the diminution of the viscosity of the serum and the refraction values are compensatory processes. Even healthy individuals may show an isolated increase of erythrocytes alone or of the hemoglobin alone at high altitudes. As a rule high erythrocyte values correspond with relatively diminished hemoglobin values. This occurs in tuberculous patients in proportion to the time of the accommodation, but about twenty-four per cent. of the cases show a primary increase of the hemoglobin without an increase of erythrocytes (pernicious type). In a certain group of severe cases of tuberculosis (with rapid extension of the process over extensive pulmonary areas, pneumothorax) the erythrocytes and hemoglobin values are greater than the medium values in healthy individuals. The reduction of the respiratory surface of the lung is compensated for by the increased surface of internal breathing. In cachectic cases a reduction of the erythrocytes and the hemoglobin is usually demonstrable, which is always a prognostically unfavorable sign. The erythrocyte and hemoglobin values in cases of surgical tuberculosis that were treated with heliotherapy are far below those of the average in the first, second, and third stages, in spite of good results with sanatorium treatment.

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Medicolegal Notes.

EXPERT TESTIMONY AS TO DIRECTION FROM WHICH SHOTS FIRED HELD INADMISSIBLE

In a murder case a medical witness for the state, who had testified to the different wounds on deceased's body and that a bullet entered the upper part of the arm, was asked the following question by counsel for the state: "From your experience in examining wounds of that sort and character, and as a practising physician, would you say that wound indicated from which direction it was fired, whether from the front or rear?" Over objection the witness answered: "I would say it wasn't fired from the front." Motion to exclude the answer was overruled. The witness had testified that he was not an expert on the question as to the direction from which shots were fired. He was a medical expert only.

Holding that the opinion of the witness was inadmissible, the Alabama Supreme Court said that the matter about which the opinion of the witness was sought was an inference from facts which it required no peculiar skill or particular fitness to solve, and which it was the province of the jury alone to determine. It was proper for the witness to describe the wounds, and for the jury to draw the inference as to the direction from which the shot was fired. Humber v. State (Ala.) 99 So. 68.

CONSTRUCTION OF PHYSICIAN'S CONTRACT TO TREAT INJURED EMPLOYEES

The Alabama Supreme Court holds, American Mut. Liability Ins. Co. v. McDiarmid, 99 South, 849, that under a contract between a physician and surgeon and an insurance company by which the former agreed to treat, on the insurance company's account, all cases of accident occurring to employees of a manufacturing company, arising out of their employment until the injured employee should be able to return to work for compensation, at the rate of 17½ per cent of the premium paid to the insurance company, the surgeon could not recover, in addition to this agreed on compensation, payment for the continued treatment, after the contract had expired, of employees injured before its expiration.

INDICTMENT FOR PRACTISING WITHOUT LICENSE UNDER WEST VIRGINIA STATUTE

The West Virginia Supreme Court of Appeals, State v. Morrison, 123 S. E. 678, holds that an indictment which charges that the defendant "without having first complied with sections 9, 10, and 11 of chapter 150 of the Code of West Virginia, governing the applicants and issuing certificates to practice medicine and surgery in the state of West Virginia, and without having first obtained a state license so to do as required by the laws of the state of West Virginia, did unlawfully practice medicine and surgery as defined in chapter 150, section S—A, Barnes' West Virginia Code Annotated 1923, "is not subject to demurrer because it does not point out the particular acts done by defendant. Upon demurrer to such an indictment the court will not determine whether one who, without the license prescribed, practises chiropractic, does or does not come within the inhibitions of the statute, since the particular acts performed by him in the practice of his profession are not described. The court is not, upon demurrer, called upon to determine what particular acts constitute the practice of medicine and surgery, and it would be improper, upon the present record, to determine whether the practice of chiropractic, without the license or certificate prescribed, by the statute, is inhibited.

ALABAMA STATUTE HELD AS NOT DISCRIMINATORY AGAINST CHIROPRACTORS

The Alabama Court of Appeals holds, Jackson v. State, 99 South. 826, that under the laws of the state any person who treats, or offers to treat, disease of human beings, by any system of treatment whatsoever, must obtain a certificate of qualification so to do from the state board of medical examiners, and the treating or offering to treat diseases of human beings without having obtained a certificate of qualification from said board is a misdemeanor (Acts 1915, p. 661), and this applies to the chiropractor as well as to any one who treats, or offers to treat, diseases of human beings by any system of treatment. In other words, under the present law the privilege of engaging in the calling or profession of treating or offering to treat, disease of human beings by any system whatsoever, is denied to all persons who have not obtained the required certificate of qualification from said board.

This statute, it is held, is not unconstitutional, but is a valid exercise of the police power, having as its purpose the protection of the public. It "is not discriminatory, as the authority of the state board of medical examiners to issue certificates of qualification is not limited to those who desire to enter the profession as homeopathic doctors, but extends to all schools or systems of treatment. Therefore the chiropractor is not excluded or discriminated against under the provisions of this statute, for he has the same right to apply to the board for the required certificate of qualification as has the osteopath or homeopath, and if the necessary certificate of qualification is awarded him, there is nothing in the law that denies him the right to pursue his method known as the chiropractic system of treatment."

Where, in a prosecution for treating diseases of human beings without license, the state has offered testimony showing that the defendant treated diseases of human beings, the burden is held to be on the defendant to show that he has obtained the certificate of qualification required by law.

ESSENTIALS OF DYING DECLARATIONS

It is essential to the admissibility of dying declarations that at the time they were made the declarant should have been in actual danger of death, that he should then have had a full appreciation of his danger, and that death had ensued. Dying declarations, to be admissible, must relate to the facts and circumstances of the shooting, and are admissible to prove any relevant fact embraced in the res gestae of the killing, if the deceased would have been authorized to testify to it if he had lived and been present at the trial. Dying declarations are limited to the act which caused death or the crime and the res gestae. Humber v. State (Ala.), 99 South, 68.

SICKNESS FROM INHALING EMERY DUST HELD NOT COMPENSABLE

The Indiana Appellate Court, Moore v. Service Motor Truck Co., 142 N. E. 19, holds that an employee in charge of emery wheels in the grinding department of a motor truck factory who knew that the air in which he worked was impregnated with emery and metallic dust; that it was passing into his lungs and bowels; that it had made others sick and was injuring him from day to day, and who ultimately suffered from a sloughing of the lining of his bowels, leaving raw areas, could not recover under the Workmen's Compensation Act as for the result of an accident, his condition not being an unlooked for mishap or untoward event not expected.

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Surgical Injuries of the Ureter

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A symposium on surgery of the ureter was held at the annual meeting of the Medical Society of the State of Pennsylvania, in Pittsburgh, October 4, 1923. I read a paper on The Treatment of Accidental Occlusion of the Ureter, reporting six personal cases. Since presenting this paper I have had the unhappy experience of encountering another case and this I regard as a legitimate text for an additional contribution.

In the original article the various phases of surgical injury of the ureter were considered. In preparing material for the paper the large number of cases reported in the literature indicated that surgical accidents of the ureter were by no means uncommon. Most writers seem to regard operative trauma of the ureter as exceptional and nearly all are in accord in believing unilateral injury unusual and bilateral damage exceedingly uncommon.

Only a few papers have been written on ureteral damage which have reviewed the subject in more than a superficial way. Most of the contributions have been in the form of case reports with an expression of personal views relating to special features of ureteral damage. The large number of cases previously recorded have not been thoroughly correlated.

Recently a few papers have appeared, notably one by Herman, recording a series of twenty-four bilateral cases. Barney has recorded sixty-two cases, including thirty-two reported by Sampson in 1902. Oeconomos has chronicled a series of 159 cases.

In collecting material for this paper, I was able to collect from the literature 316 cases and I gathered 125 additional cases from men active in abdominopelvic surgery. These give a combined total of 441 cases, the largest number compiled in a single paper thus far presented. Even with this large array of collected cases, there are probably a large number of others which have not been recorded and still others which have not been recognized. In the 316 cases found chronicled in the literature, fifty-eight were bilateral, including the twenty-four cases reported by Herman, and 258 were unilateral. To these 316 cases we have reports of fifty-one representative surgeons from various parts of this country. Nine of these men assert that they have had no personal cases, but have seen cases in consultation or knew of cases in the practice of their contemporaries. Forty-two surgeons reported 125 cases, ranging from one to eight with an average of three each. Of this number twenty-three were bilateral and 102 were unilateral. These combined aggregate 441 cases, of which eighty-one involved both sides and 361 one side alone. This collection we believe represents the largest number of cases hitherto recorded. The previous largest collection, 159 cases, being reported by Oeconomos in 1914.

Despite the prevailing belief that ureteral damage is rare, I believe it to be one of the most, if not the most frequent, as well as the most serious accident of pelvic work—frequent because confirmed by the large number of cases I have been able to collect; serious because often associated with kidney destruction, and still more serious because it carries a higher mortality than any other accident of major pelvic surgery.

Owing to the present mode of exposing the ureters by free dissection—the technic usually followed in extensive pelvic operations today—ureteral damage is perhaps not so frequent as it was a decade or two ago, an era when "suppression of urine" was not infrequently cited as a cause of death. Probably certain percentages of deaths following hysterectomy, both vaginal and abdominal, and extensive pelvic operations in general, in which the cause of death was ascribed to suppression of urine, were actually due to ureteral occlusion. Postoperative urinary suppression in the true sense, heretofore occasionally designated as a cause of death, now rarely is mentioned. I am extremely doubtful of the existence of this trouble as a postoperative entity. Even the case of anuria and death following unilateral ligation as recorded by Barney, may have had its origin in injury of the opposite ureter or in preexisting renal disease. Barney, in unilateral experimental ligation of the ureter performed upon thirty-seven animals, found that the renorenal reflex, as evidenced by anuria, did not occur in a single instance.

Ureteral damage is most frequently inflicted during the performance of some type of deep pelvic surgery and the two operations most frequently responsible are abdominal and vaginal hysterectomy. The vaginal method of extirpating the uterus exacts a definite toll, but not to the extent it did a decade or two ago. Radical abdominal hysterectomy, especially for carcinoma of the uterus, is the operation

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most frequently responsible for the injury today. However, since the advent of radium in the therapy of uterine cancer, the extended abdominal operation is slowly but surely finding its place in the category of obsolete methods. With the wider use of radium ureteral damage as a sequel of pelvic surgery will become progressively less frequent.

It is quite safe to say that every deep pelvic operation carries the potential hazard of ureteral injury. The anatomical position of the tube exposes it to unusual jeopardy in nearly all extensive operations performed within the dependent part of the pelvic cavity. No section of the tube, however, is free from danger. Even in the renal region, damage has been inflicted, either as the result of ligation or clamping. The section most frequently exposed to the vicissitudes of surgery is that extending from the brim of the pelvis to the vesicoureteral junction. On the right side even the section above the pelvic brim in the region of the appendix has been injured. In the midsection damage has been sustained during the course of operations upon the Fallopian tubes for inflammatory disease and also in operations for broad ligament cysts and for retroperitoneal neoplasms, both benign and malignant, though injuries of the tube above the cervical section are rather exceptional. It is the cervical area which is involved most frequently by far in accidental damage and it usually results from the application of clamps or ligatures to the uterine vessels, during the course of hysterectomy for cancer. The cervical section is also the most frequent site of injury in vaginal hysterectomy, especially as performed by progressive ligation or clamping from below upward. In the modern method of extirpating the uterus through the vagina by inverting the fundus and ligating the broad ligaments with their vessels from above downward accidental damage, while it occasionally does occur, is not nearly so likely as in the technic formerly in vogue.

SIDE AFFECTED

In studying the tables accompanying this paper, it is interesting to observe the relative frequency of injury of the two sides.

In the combined total of 361 unilateral cases the right side was affected in 132 cases and the left side in 132 cases. In ninety-seven, the side injured was not mentioned.

From these figures one is justified in assuming that ureteral damage is about equal on the two sides. In addition to the unilateral cases there were eighty-one cases in which the injury involved both ureters.

In this connection it may be of interest to report my personal experience. During the past fifteen years I have injured the ureter on six different occasions and I have assisted Dr. E. E. Montgomery in performing a double ureterovesical anastomosis for bilateral ureteral occlusion.

Case I.—The first patient on whom the injury was inflicted, was operated upon for advanced carcinoma of the cervix. The operation was performed fifteen years ago. A radical abdominal hysterectomy was performed. Ten days subsequently a ureterovaginal fistula was discovered. Examination disclosed the right ureter severed. Three months after the primary operation, the vaginal vault, in accordance with the plan of the late Dr. X. O. Werder, was converted into a part of the bladder cavity. The patient made a complete recovery and is living and well today.

Case II.—This patient was operated upon for extensive carcinoma of the cervix and a radical Wertheim hysterectomy was performed. Two weeks following the abdominal operation, urine escaped into the vagina and a ureterovaginal fistula was found. Examination revealed the left ureter as the seat of trouble. Two months later the abdomen was reopened with the view of implanting the ureter into the bladder or performing a ureteroureteral anastomosis. Owing to the presence of dense adhesions about the ureteral stump, considerable damage was inflicted during its liberation. This, together with obvious signs of infection, led us to abandon the plan of anastomosis. A nephrectomy was performed. Convalescence of this patient was not disturbed. She left the hospital on the twenty-fifth day after operation. She is still living and well.

Case III.—The third patient was also operated upon for carcinoma of the cervix. The uterus was removed in accordance with the plan advocated by Wertheim and the usual course of dissecting out and protecting the ureters was followed. Before peritonizing the cervical stump and the stumps of the pelvic ligaments, the routine plan pursued by the writer of making a final inspection of the ureters, was carried out. This disclosed the right ureter normal. The tube upon the left side, just where it is traversed by the uterine vessels, was found almost completely severed. The severed ends were attached to each other by a ribbonlike band. The tube had evidently been incised with scissors in cutting the uterine vessels. The various methods of correcting an injury of the type mentioned were considered. The choice of operation appeared to resolve itself into a ureteroureteral or a ureterovesical anastomosis. Owing to the small size and undilated condition of the damaged tube, the latter recourse was adopted. The recovery of the patient was not further complicated and she left the hospital at the end of the third week. She survived the operation eighteen months, finally succumbing to recurrent malignant disease. This case emphasized the fact that in spite of every possible precaution ureteral damage may still be inflicted.

Case IV.—In the fourth patient the left ureter was incised, but not recognized, during a hysterosalpingooophorectomy for extensive pelvic inflammatory disease. A ureteroabdominal fistula appeared on the fourth day. The patient died on the sixth day of septic peritonitis.

Case V.—This patient was operated upon for complete prolapse of the uterus. A vaginal hysterectomy was performed. The uterine vessels on the left side retracted and considerable difficulty was experienced in securing them by ligation. In endeavoring to obtain hemostasis the left ureter was pinched with a hemostat or partially occluded in a ligature. Two weeks following operation, urine was discharged from the vagina and a left ureterovaginal fistula was discovered. This patient was kept under observation and at the end of three months the damaged ureter had closed spontaneously. This case occurred quite recently and the patient is reported well.

CASE VI.—This patient also was operated upon for complete prolapse. The trouble was of several years' standing. Vaginal hysterectomy was performed. Considerable difficulty was experienced in controlling the bleeding, owing to vessel retraction on the left side. The bleeding vessels were finally secured by the application of long curved hemostats. These were allowed to remain in position for seventy-two hours. The patient was operated upon in May, 1923.

Dribbling of urine started shortly after the removal of the clamps and continued until July, 1923. She was free from dribbling until August. The trouble then recurred periodically until March, 1924. She was then readmitted to the hospital, and the fistula was found high up in the left vaginal fornix. The trouble was corrected by a high colpoclysis, as advocated by the late Dr. Werder, of Pittsburgh. This method of correction was only partially successful. The patient returned to the hospital in May, 1924, complaining of "slight dribbling." Examination revealed a small opening in the bladder and a persistent ureterovaginal fistula. The vesical opening was closed. The left ureter was exposed through a free abdominal incision and ligated in two places. The patient had a perfectly normal recovery and now is entirely well.

CASE VII.—The seventh patient was operated upon by Dr. E. E. Montgomery for advanced cervical carcinoma. A radical abdominal hysterectomy with wide excision of the parametrium was performed. Both ureters at the site where they are crossed by the uterine vessels were ligated and severed. The accident was not recognized at the time. Complete anuria followed the operation. Thirty-six hours subsequently the abdominal incision was reopened. The stump of the cervix was exposed and the incised ureters liberated and deligated. A double ureterovesical anastomosis was performed. The convalescence of the patient was surprisingly mild. She survived the operation without any urinary disturbance for one year, finally dying from recurrent malignancy.

TYPE OF OPERATION IN WHICH URETERAL INJURY MAY BE INFLICTED

While hysterectomy, either abdominal or vaginal—but more commonly the former—is largely responsible for ureteral injury, there are a great many other surgical procedures on which responsibility may be placed. A tabulation of operations—twenty-four in all—in which the accident has occurred, will be given.

In order of frequency they may be summarized as follows:

1. Radical abdominal hysterectomy (Wertheim's method for cervical carcinoma).
2. Radical vaginal hysterectomy (Shauta's method for cervical carcinoma).
3. Combined vaginal and abdominal hysterectomy for cervical carcinoma.
4. Vaginal hysterectomy (clamp method for uterine conditions other than carcinoma).
5. Total abdominal hysterectomy for uterine myomata, especially if adherent and associated with intraligamentous growths.
6. Operations for the removal of intraligamentary cysts.
7. Subtotal hysterectomy (supravaginal) for myomata, especially if adherent or complicated by intraligamentary neoplasms.
8. Hysterosalpingooophorectomy for extensive pelvic inflammatory disease.
9. Herniotomy, especially if complicated by congenital or acquired malposition of the bladder and ureter (Corliss in 1904, reported eleven such cases, six inguinal and five femoral) (Herman).
10. Operations for the removal of vesical neoplasms.
11. Surgical correction of vesicovaginal fistulæ.
12. Operations upon or in the region of the kidney itself.
13. Poro operation (two cases are recorded in the table accompanying).
14. Operations upon or about the appendix and cecum.
15. Operations upon or about the sigmoid and rectum.
16. Operations for removal of retroperitoneal pelvic tumors.
17. Extensive plastic operations upon the anterior vaginal wall, especially for uterine prolapse.
18. Perforation of the ureteral wall in passing the ureteral catheter. (See case reported by Noble).
19. Operations upon a horseshoe kidney or where double ureters exist.
20. Trauma of the ureteral wall from undue manipulation or from damaging the blood supply, followed by necrosis in various pelvic operations.
21. Kraske's operation for rectal carcinoma.
22. Percy's method of treating uterine carcinoma.
23. Ureteral injury sustained from the application of radium. (Baldwin's case.)
24. Instrumental labor.

The operations in which the accident occurred in sixty-one bilateral cases were mentioned in fifty-eight as follows:

Abdominal hysterectomy	40
Vaginal hysterectomy	6
Supravaginal hysterectomy	4
Percy cautery	3
Pelvic operation	3
Oophorectomy	2

In 258 unilateral cases the operations ascribed as responsible for the injury were:

Abdominal hysterectomy	164
Vaginal hysterectomy	32
Salpingooophorectomy	19
Myomectomy	9
Combined vaginal and abdominal hysterectomy	4
Sacral hysterectomy	4
"Laparotomy"	1
Posterior colpotomy	1
Porro operation	1
Type of injury not stated	23

TYPE OF INJURY

The type of injury is variable, depending somewhat upon the character of the operation. The most frequent forms of injury are: 1, Ligation; 2, incision; 3, excision; 4, necrosis following undue manipulation or cutting off the blood supply.

The injury may involve one or both ureters and it may be partial or complete. Damage has also been inflicted by heat in applying the Percy cautery and partial destruction of a ureteral wall followed the application of the electrothermic angiotribe, as in the case recorded by Fisher. Indirect damage with

necrosis and fistula formation results from undue manipulation and from destruction of the nutrient vessels. Wertheim, in sixty hysterectomies for cervical carcinoma in which the ureters were exposed for a considerable distance, records five ureterovaginal fistulæ, two of which were bilateral. These Wertheim believed represented necrosis from cutting off the blood supply. In some cases a moderate or even a large section of the tube may be completely excised. Radiotherapy also has a place in the etiology of ureteral damage. A case, mentioned by Baldwin, is recorded in this article.

In fifty-two bilateral cases in which the type of injury was mentioned the ureters were ligated, severed, clamped or damaged as follows:

Ligated	34
Ligated and severed	15
Clamped	3

In 258 unilateral cases the operations ascribed as tioned in 207 as follows:

Severed	100
Ligated	48
Clamped	19
Damaged	16
Excised	8
Torn	7
Partially severed	3
Punctured	3
Obstructed by scar tissue	2
Perforated by ureteral catheter	1

CONCLUSIONS

1. From the large number of cases of ureteral damage herewith presented, it is apparent that the accident is a surgical complication of some magnitude and more frequent than generally is assumed.

2. No doubt a certain number of ligations occur which are never recognized and which do not provoke symptoms, though kidney destruction results inevitably.

3. Damage to the ureter may be inflicted in any section of the tube from its renal origin to the vesicoureteral union, though the cervicovesical section is the most frequent site of injury.

4. Ureteral damage may be inflicted during the performance of a wide range of surgical operations. It is most likely to occur during the course of hysterectomy, especially the radical abdominal operation for uterine cancer.

5. Extensive pelvic operations other than hysterectomy may be responsible for the damage, especially those for intraligamentary neoplasms.

6. In most cases the injury is unilateral. In a certain number of cases both sides are affected, the proportion being approximately six to one.

7. Damage occurs with almost equal frequency upon the two sides. In 361 cases, the right side was affected 132 times and the left side 132 times. In ninety-seven cases the side affected was not indicated.

8. As a surgical complication, ureteral damage is responsible for a certain number of deaths, showing a mortality of bilateral cases of 33.3 per cent. and in unilateral cases a mortality of 18.8 per cent.

9. Irrespective of the mortality entailed, ureteral injury is associated with serious local results both immediate and remote, immediate in the formation of urinary fistulæ (twenty-four per cent.), remote in causing inevitable renal destruction.

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Local Anesthesia in the Tuberculous Patient*

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Immediately upon arriving at a decision that it is necessary to carry out a surgical procedure upon a tuberculous patient, it is obviously the surgeon's duty to surround the patient with every known, or at least every available safeguard, not only in a general sense, but in a local sense as well, in aiding him to undergo the surgical attack with the least possible reaction. Not only should the patient's resistance be brought to the highest level but, if the surgeon is to meet his obligation to the fullest extent, he must use methods which, while meeting the surgical indications in their entirety, coincidentally reduce the patient's vitality as little as possible and fortify him against the possible inroads of postoperative reactions and complications. While these platitudes are recognized by all surgeons and adhered to by most of them, it is safe to say that only in the types in which surgical intervention may be considered dangerous to life do the majority of surgeons weigh the several factors involved with sufficient care. Indeed one may question the throughness with which many surgeons evaluate the pros and cons of even the most dangerous surgical procedures before they are put into execution. It would seem at least not unfair to ask if every surgeon offers to every handicapped patient every possible means of resisting the potentialities of a lethal outcome, as well as the variations in postoperative morbidity, as they may be influenced by the varying types of surgical treatment which may be instituted in a given case. A possible death, innumerable complications, delayed convalescence, increased expense, and mental and physical suffering, all hold positions of importance often rivalling and not infrequently exceeding the gravity of the condition which demands operation.

All authorities agree that in treating the tuberculous patient who presents a surgical lesion, we are dealing with an individual who is handicapped. It makes no difference whether the particular surgical lesion with which we must deal is of a tuberculous nature or not, we must face the fact that the patient is handicapped to a greater or lesser degree and that in cases in which the surgical lesion is tuberculous convalescence will be retarded beyond the average time. The various factors encompassed by the term "resistance" of the patient will govern the outcome to a large extent.

*Read before Lymanhurst and Parkview Medical Staffs, Dec. 30, 1924.

The methods of building up the resistance of a patient are well known, although it is probable that patients undergoing surgical treatment do not invariably receive their benefits to the fullest possible extent.

As the application of surgical therapy is inherently, for the time being, a reducer of the normal resistance of all patients and especially so of the tuberculous patient, it is our desire to discuss as briefly as possible our conception of some of the means by which the tuberculous patient and tuberculous lesions may be attacked surgically with as slight a lowering of the patient's resistance as is possible in the light of the knowledge of the present day.

We shall leave to others the consideration of the means by which a patient may be brought to a condition of maximum preoperative resistance—although we would stress to the fullest extent its necessity—and discuss more or less specifically the means by which the patient's resistance may be maintained during and after operation.

A number of factors may be considered. Chief among these is perhaps the carrying out of the surgical procedure with a minimum amount of shock. Following this the elimination of all possible postoperative complications assumes an important rôle, and again, a comfortable, early convalescence under auspices which are conducive to increasing the patent's resistance to the highest point.

The ideas embodied in the preceding paragraphs bring us to a consideration of the subject of this paper, local anesthesia in the tuberculous patient.

The use of local anesthesia combined with the technic which its use demands has, in our judgment, few fields where its good offices may be said to be more desirable than when dealing with this class of patients. As stated above, their resistance is usually lowered. When extrapulmonary tuberculosis exists as a surgical entity, it is not uncommonly secondary to or accompanied by a focus in the lungs. It is therefore most desirable to interfere as slightly as possible with the pulmonary function. Our premise is that the resistance of the severely handicapped will be less reduced by the use of this most benign method and that those who are not in so hazardous a condition, but who have two or more foci of infection in the body, are less likely to have their resistance lowered when local anesthesia and a refined technic are used when operating upon them than when they are operated upon under general anesthesia and the technic by which it is usually accompanied.

In considering the question of local versus general anesthesia in the treatment of tuberculous patients one must not overlook the fact that by far the greatest amount of surgery is performed by those who are below the average in surgical ability and under auspices which are far below the ideal and that, if it is admitted that the local anesthesia method is more benign in the hands of the expert, who is usually equipped with the best protective measures that can be afforded under general anesthesia, it is certainly true in the case of those who are not so expert or not so well equipped. A comparison of the incidence of postoperative pulmonary infections following operations upon the mouth and throat when general anesthesia is supervised by experts with that in which it is not so supervised, will serve to illustrate this point, and yet surgeons of world wide repute, who are equipped with every facility for protecting a patient while operating under general anesthesia, are almost a unit in their choice of local anesthesia for the hazardous risk. The reasons for this are apparent. General anesthesia produces its deleterious effect upon the various tissues and organs almost in direct proportion to the length of time and the amount of the drug administered. It is therefore incumbent upon the surgeon to complete an operation when using general anesthesia with the greatest possible expedition. Haste as a rule is conducive to hemorrhage, trauma and incomplete work, whereas with the elimination of haste the converse obtains. For example, we have had the experience of seeing a patient go into collapse following the ablation of adherent tuberculous tubes after an operation which was completed in less than twenty-five minutes under ether anesthesia. We have also performed the same type of operation under local anesthesia upon patients of apparently the same resisting power without any apparent reaction when the time required for the operation was an hour and a half. This experience has been repeated so frequently that we have no hesitation in stating that in our judgment careful, methodical, clean, sharp dissection, mild retraction, the avoidance of hemorrhage and the observing of the utmost respect for the tissues will be rewarded by a reduction in the amount of shock and will hasten the postoperative convalescence. In other words, the patient's resources will be conserved when more careful methods are used.

In order to be more specific one might consider the strain placed upon the pulmonary mechanism under general anesthesia with that obtained when local anesthesia is used. Assuming, if you so desire, that postoperative pulmonary complications are largely embolic in origin, has not the patient who is the victim of a tuberculous pulmonary lesion—no matter what the extent of this lesion may be—a better chance of resisting his infection and reacting from his operative procedure when local anesthesia has been used than if the laryngeal reflexes have been inhibited by the effects of a general anesthetic and the air passages are waterlogged with infectious material which has been drawn into them from the mouth and nose?

It has been long recognized that the assimilation of nourishing food and large quantities of liquids are prime essentials in combating the ill effects of tuberculosis and surgical operations. The fact that the patient with surgical tuberculosis is not compelled to curtail to any great degree his intake of nourishment either during or after operation constitutes an important advantage of local anesthesia.

Although space will not permit a complete discussion of the numerous tuberculous lesions which must be treated surgically, unilateral tuberculous kidney might be mentioned as an outstanding example. Here as in many other conditions the advantages of local anesthesia are manifold. The pulmonary function is not interfered with, nourishment is assimilated in practically a normal manner, local trauma and shock are reduced to a minimum and above all the function of the remaining kidney is depressed to the slightest possible degree. Another outstanding example is in the case of operations for the cure of

unilateral pulmonary tuberculosis. Theoretically, the ideal procedure should be a fractional operation under an intercostal block with novocaine, with a clean dissection, an absence of hemorrhage and the slightest possible embarrassment of the healthy lung. Speed, with its resulting trauma and hemorrhage, plus the inhalation of septic mucus from the trachea are not, in our judgment, compatible with the ideals of modern surgery. The fact that a large percentage of patients survive despite the application of the methods to which we object is hardly sufficient license to warrant their choice.

TECHNIC

The technic of inducing local anesthesia in tuberculous patients differs somewhat from that which we prefer to use in the nontuberculous. Here regional anesthesia is the method of choice. The anesthetic solution should, perhaps, not be injected into tuberculous areas, although as a matter of fact this point has not been definitely proved. Fortunately, conductive anesthesia is applicable to almost every region which must be attacked surgically: the neck, the breast, the thorax, the spine, the testicle and epididymis or the limbs may be successfully orientated from the central nervous system by nerve or infiltration block by any surgeon who is willing to spend a short time in equipping himself with the necessary knowledge and paraphernalia. Even in abdominal tuberculosis the abdominal wall may be anesthetized regionally and after the abdominal cavity has been opened anesthesia by the anterior splanchnic method may be induced.

CONCLUSIONS

In conclusion may I reiterate that, whereas every patient who presents himself for surgical treatment is entitled to every safeguard at our disposal, this is especially true of those afflicted with tuberculosis.

The tuberculous patient should, whenever possible, have his resistance raised to the highest level before being subjected to a surgical operation. Local anesthesia and a refined technic offers the tuberculous patient requiring a surgical operation the best chance of maintaining his already lowered resistance during and following the operative procedure of any method available at the present time.

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Medical Work in Syria

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During the school year of 1922-23 the Medical Department of the American University, of Beirut, Syria, studied five hundred patients in the hospital and thirty-one hundred in the outpatient department. This report deals particularly with the five hundred male and female adult hospitalized patients. The hospital (1) was composed of four buildings of the pavilion type, and is a part of the medical department of the university. The number of beds in use by all departments was 165. Twenty-two beds were allotted to the medical service; these at stress times were supplemented by floor cots.

Each patient was examined by a fourth year, assisted by a third year, medical student, supervised by first assistant, George Khayatt, and reported at the bedside to either myself or the adjunct professor of medicine, Joseph Yennikomshion. The average time each patient spent in the hospital was eleven and one half days. Thirty-six per cent. of the five hundred patients were females and sixty-four per cent. males. The predominance of men may be accounted for by the fact that about two thirds of the Syrians are Moslems; and the Mohammedan women do not accept hospital service as readily as their Christian sisters.

The raising (2) of the general health standard of people thereby increasing their general usefulness and happiness is certainly a Christian act. This is the aim of those who are doing medical missionary work in Syria, for it is fully realized that this elevating act must be done through sanitation and health service to prevent disease; all of which involves housing, labor age, and private and public enterprise, etc., for conserving health.

Twenty-seven patients of the five hundred died. Autopsies were performed on twenty-five, which demonstrates how well the newly organized pathological service of Douglas Cruickshank and our assistants worked in securing autopsies. While autopsies are not popular in any country this is particularly true of Syria, for the burial teachings of Moses are still believed by Moslem and Jew (*Deuteronomy*). During the previous year but three autopsies were held from the same medical service.

Of the five hundred admitted to the hospital, eighty-six were listed as transferred and unimproved; the transferred included those sent to other services and other hospitals. The remaining four hundred and fourteen were charted as arrested, improved, or recovered; the word "cure" was never permitted. For example, a malaria infection was arrested; a focal infection sufferer improved; and when a typhoid fever patient left the hospital convalescing, recovery was charted.

That we were handicapped in our work is readily admitted, most missionary institutions are handicapped. The greatest handicap was the lack of facilities to work out the diagnosis properly. When I went to Beirut the laboratories (aids in diagnostic medicine) were as follows: There was no fulltime pathologist; the hospital bacteriologist was the instructor in the practical course of physiology as well as the adjunct professor of internal medicine (the latter title without duties); the x ray was of an obsolete type nineteen years old, and at so great a distance from the medical building that it was impractical to transport patients to it. But no difficulties were insurmountable and I am happy to

state that the medical school is getting along fast towards an A plus rating.

Uniform history charts and records for all services, like those used in standardized American hospitals, were recommended and introduced. During the previous year, one hundred and eighty patients were admitted to the medical service, against the five hundred herein reported, which helps to demonstrate the growth of the work.

It was not long before we were able to obtain regular Wassermanns, agglutinins, for typhoid and typhus, complement fixation for hydatid cyst, tuberculin, and other tests, from the hospital clinical laboratory. The native doctors and students and most of my colleagues were enthusiastic for the methods of modern medicine, especially the thorough examination (3) of the patient before a diagnosis.

A brief review of the various diseases follows:

MALARIA

Malaria was positively diagnosed in eighty-nine patients by the recognition of the plasmodium in the blood. Often a sunbath or a provocative dose of quinine sulphate was helpful in bringing the organism into the peripheral circulation. Quinine sulphate by mouth in sufficient amounts and administered over a sufficient length of time was effective in arresting all types of malaria (4). The earlier the infection was recognized and proper treatment administered the better were the results.

The types recognized and treated to an arrest were: tertian, sixty-three; quotidian, nineteen; and quartan, seven.

All of these patients had enlarged spleens. After the chills and fever had subsided the spleen decreased in size. I had the opportunity of seeing the spleen of a man who died as the result of pneumonia; the history yielded the fact that he "had just recovered from an attack of malaria prior to the pneumonia"; the capsule of the spleen was greatly wrinkled. Does the spleen enlarge as a pathological part of malaria, or as a therapeutic measure to protect the owner? An enlarged spleen was also recorded on 141 other charts as follows: from an easily palpable spleen, seventy; from one to seven fingerbreadths below the costal margin, seventy-one. Splenic punctures were made and the smears examined in a number of doubtful malaria cases without any positive diagnostic results.

INTESTINAL PARASITES

Raw meat is a common article of food in the native's diet. Pork is not on the Mohammedan and the Jewish bills of fare, which accounts for the rarity of the pork tapeworm. The beef tapeworm is the most common. Our star patient yielded ten heads of this type and seven round worms; he had been admitted for "pleurisy with effusion" and did have two quarts of seropurulent fluid removed from his left pleural sac. He was discharged as improved and recovered. Anemia was a constant symptom in the parasite carrier.

The male fern procurable was ineffective in getting rid of tapeworm. The converse was true of pumpkinseed. Pumpkinseeds were ground up and administered with honey or sugar, after a fast and a purge. Calomel and santonin were effective for killing the round worm. Frequently eggs of both were found in the stool of the same individual. Most of these patients were admitted for other diseases, for example, typhoid, pneumonia, and other conditions. Prior to 1922 the medical service made no attempt to strain the stools for worm heads, most being satisfied to get rid of a few yards of the worm. By many over there, worms and lice are put in the same category, necessary evils. Diagnosed and treated for: tænia saginata, ninety-two; ascaris lumbricoides, fifty; trichocephalus dispar, eighteen; oxyuris vermicularis, six; and tænia solium, two.

FOCAL INFECTION (NONPARASITIC)

This was found and considered an active cause of disease in 198 persons, and eradicated. It was treated as follows: peridental, 160; tonsillar, twenty-eight; frontal sinus and antra, five; and ear, five. The dental department, with Arthur Dray at its head, was an effective factor in caring for the infection referable to teeth.

LUNG AND PLEURAL DISEASES

The patients in which a diagnosis of active tuberculosis could be made at the outpatient department were not admitted to the A. U. B. Hospital. In each of the thirty-four listed below the bacillus was found in the sputum. Three were admitted to the hospital in a dying condition for autopsy instruction; thirty-four were transferred to the fifty bed tuberculosis sanatorium at Shebonyia, the only hospital in Syria where any special attempt is made to care for pulmonary tuberculosis. I note that asthma was diagnosed thirteen times,—I permitted this for no other reason than insufficient knowledge; asthma, like anemia, is a secondary condition and not a disease. The group: active tuberculosis, thirty-four; pneumonia, twenty-eight; bronchitis, thirty; socalled asthma, thirteen; pleurisy, twenty-eight; hemothorax, one; and pneumothorax, one.

DYSENTERY

This term was used to designate that class of cases in which the chief complaint was protracted diarrhea. Fresh warm stools were always examined. Rest, opium, heat to the abdomen by a woolen binder and hot water bottle, and hot liquid nourishment, preferably milk, were most effective as treatment for these cases. That emetin is a specific for the amebic type is unproved (5). It is valueless in the bacillary. For the latter, "serum" is used,—I saw no untoward effect from its use. The list comprised: amebic dysentery, twenty-two; colitis of various types, thirty-five.

CARDIORENAL VASCULAR DISEASES

Briefly the list was:

Nephritis (dry)	17
Nephritis (wet)	14
Valvular heart disease	28
Arteriosclerosis	18
Hypertensive cardiorenal vascular	13
Pyonephrosis	5
Renal calculus	3
Renal tuberculosis	1
Bilharziosis (infected in Egypt)	1
Aortitis (syphilitic)	1

GOITRE

No severe toxic goitres were observed in over four thousand patients, the total of the year's medical work, and but few were mildly toxic. Of the five hundred studied in the hospital there were: adenomatous, six; adenomatous moderately toxic, two; colloid, four, and cystic, one.

INFECTIOUS DISEASES

In treating encephalitis, Rosenow's antiencephalitic serum, which he so kindly sent in February, 1923, was used in three of the acute cases of epidemic encephalitis (6); it seemed to hasten recovery and shorten convalescence. The chronic encephalitis patients were admitted to the hospital for study and teaching purposes only. Typhus came from Turkey (Armenian refugees); they had head and body lice, which were exterminated before admitting the patient to the hospital bed. The sandfly fever and influenza cases were those in which a fever of short duration was the chief objective symptom and received these diagnoses, I fear, rather than the F. U. O. of the British army medical department (fever of unknown origin). I saw no dengue, as it comes in epidemics and this evidently was not its year for appearing (7). The list follows:

Encephalitis epidemic acute	10
Encephalitis epidemic chronic	4
Typhoid fever	8
Typhus fever	6
Sandfly fever	4
Influenza	3
Acute ascending paralysis	1

JOINT DISEASES

It is admitted that practically all of this group should be listed under focal infection: arthritis, various types, eighteen.

LIVER DISEASES

Hypertrophic	18
Atrophic (complicated by ascites)	7
Catarrhal jaundice	6
Cholecystitis	3
Hydatid cyst (operated upon and recovered)	1

BRAIN DISEASES

Apoplexy, thirteen; pituitary tumor (not confirmed by operation), one; hydatid cyst, one; (8).

Neuritis and allied conditions, eighteen. There were twenty-two who received the diagnosis of psychoneurosis only as a transfer term to the Lebanon Nervous and Mental Hospital, where the students had ample opportunity to study them. Insanity is prevalent among the temperamental races of the Near East.

MISCELLANEOUS

Pregnancy	12
Hydrocele	8
Acute gonorrhea	6
Lumbago	5
Hernia	5
Epilepsy	4
Herpes zoster	3
Leucemia	3
Morphinomania	2
Delirium tremens	2
Elephantiasis	2
Appendicitis	2
Lead poisoning (chronic)	1
Osteopulmonaryarthropathy	1
Urethral stricture	1
Chorea (Sydenham's)	1
Hodgkin's disease	1
Sarcoma	1
Ptomaine poisoning	1
Raynaud's disease	1

Of this group the pregnant women were in the hospital for other diseases than complications of pregnancy. In the acute gonorrhea cases the patients (males) were in the hospital for other cause. Many epileptics could have been secured; these were admitted only for teaching purposes. The elephantiasis were women with local manifestations in the leg legs; they were nonspecific; by that is meant not the Falaria sanguinis hominis type of Bancroft. At least the organism was not found, though repeatedly searched for. The myelogenous leucemia patient was a man who came from Constantinople for treatment, with the diagnosis of abdominal cancer. The routine stained blood smear suggested that the mass in the abdomen was spleen. He died from hemorrhage from hemorrhoids. In the lead poisoning case the patient received her poison from hairdye. A male patient had urethral stricture, causing acute retention; he died on the surgical service.

THE MORTALITY LIST

Nephritis (wet)	4
Nephritis (dry)	2
Valvular heart disease	4
Tuberculosis (lung)	3
Pneumonia (bronchial)	2
Pneumonia (lobar)	1
Encephalitis acute epidemic (6)	2
Cerebral apoplexy	2
Amebic dysentery (5)	1
Syphilitic aortitis	1
Hydatid cyst (brain) (8)	1
Myelogenous leucemia	1
Carcinoma (stomach)	1
Acute ascending paralysis	1
Duodenal obstruction by polyp (9)	1

Autopsies were performed on all the above except those dying from acute encephalitis.

For further data on any of these case records the reader is referred to the central office of the American University of Beirut Hospital.

Much more could be written regarding this one year of medicine in Syria; only the high spots have been touched upon so that those interested in improving the teaching and practice of regular medicine here and elsewhere may get a glimpse of the opportunities that our American medical workers have in Syria.

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Westlake Professional Building.

The Rôle of the Electron in X Ray and Radium Therapy

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Throughout the years of medical research, dating back through centuries of conquest and development, there has stood out one disease, defiant, and to date, victorious against man's effort in his search for cause, with ultimate goal of a cure. This disease, equally well known and dreaded by profession and laity, was at an early date appropriately termed cancer.

Uniting their efforts against the ravages of this malady are the surgeon, the pathologist, and the radiologist, each armed with his chosen weapon: the scalpel, the microscope, and most powerful of all, the invisible power of the electron, spontaneously generated or emitted by the physical agents of the radiologist, the x ray and radium. Thus to the army of the offense is enrolled the physicist and the chemist.

Each of these representatives of medical research and practice is confronted with his separate and complex problem. The surgeon will ask why two cases of cancer which have come under the power of his scalpel will suffer reversed fates. Both were apparently similar in every detail, both were operated upon with the greatest of care and surgical skill, yet within the allotted time one has demonstrated a complete clinical cure while the other developed metastases and died within a few months.

FIG. 1.—Theoretical structure of radium atom.

The pathologist is able, by examination of a section of tissue removed by the surgeon, to tell whether the excised growth is of malignant or benign character, but he is completely at a loss to tell us why that tissue which he has verified as malignant assumes the arrangement of cells enabling him to diagnose such as cancer. It is indeed unlikely that such a problem will ever be explained by the examination of cells which have been killed and enbalmed during the necessary preparation for microscopic examination. Nor does the pathologist tell us why such tumors possess altered staining characteristics. Here I might say that the pathologist has overlooked, or failed to find the cause of what I believe to be a most important phenomenon. It would indeed be unjust to condemn the pathologist, for such problems are for the physicist and the physiological chemist, those who have been trained to study and explain the structure and function of these minute structures, appropriately termed cells.

The radiologist asserts that the action of his powerful agents are of caustic nature, yet it is evident that he is unable to explain their action, for as time goes on, and more cases are treated under his most careful observation, he finds that many malignant tumors respond to treatment far below a caustic dose, in fact I might venture to say that in the majority of cases better results are obtained without gross destruction, this is without doubt true of superficial lesions. If not of caustic nature, to what property of the x ray or the rays and radiations from radium can we justly assign their acknowledged beneficial action in the treatment of malignant processes? This is a question which is, at the present time, arousing much interest among the scientific x ray and radium workers.

Although the outlined problems are apparently separate and distinct, they can be reduced to one fundamental question, and were one called upon to condense his question to the simplest significance, it would without doubt be one of the following character: "What is the hidden property of the socalled cancer cell which differentiates it from the normal cell? What is the concealed power that gives to formerly normal cells their stimulated proliferative powers, with the resultant formation of the neoplasm? What is the evasive something which gives to the disseminated tumor cell the power to give rise at a distant part of the body to growth similar to the one of which it was formerly a part?"

We of the present day know that our body cells are nothing more or less than aggregations of complex chemical compounds, proportioned and delicately balanced so as to carry out their allotted duties, one does not have to be a chemist to know and understand this. Those of us who have made a special study of physiological chemistry, or, I might say of even the fundamental principles of elementary chemistry, know that chemical reactions, whether carried out within the body cell or in the test tube, cannot take place without ionization and dissociation of the molecules comprising the agents involved. The ionic or electrolytic dissociation theory of chemical reactivity is without question fundamental, and we are forced to accept the reasoning that all chemical change is primarily physical or electrical, and our entire problem is readily reduced to one of biophysics.

For the benefit of any organic chemists taking exception to this statement, I should like to state that the formation of precipitate in the absence of water or current flow is by no means a conclusive argument to the above statement in face of the preponderating evidence supporting such a theory.

From the reasoning just offered it must follow that all functions of intracellular metabolism must first be physical, electrical or dynamical; second, chemical; and third, or as viewed by the pathologist, histological. These changes must, through necessity, occur in the order mentioned, therefore the initial change brought to bear within a cell undergoing malignant transformation must be electrical or biophysical, this brings about the necessary chemical

alteration which in turn, through greatly increased growth factors, develops the structural abnormality viewed by the pathologist.

However simple this may appear, it must not be confused as such. To understand the change and interchange of the molecules which go to make up

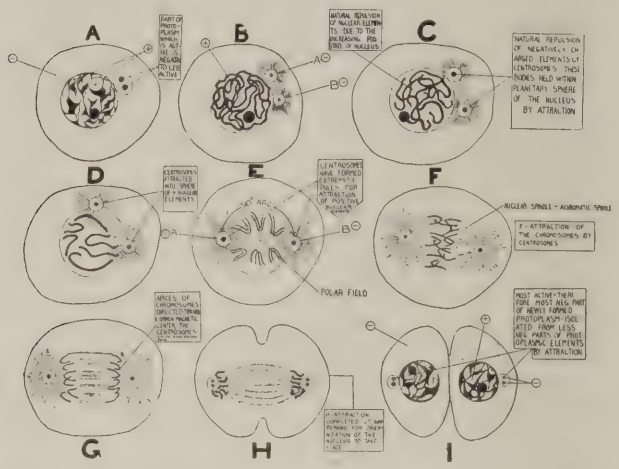

FIG. 2.—Diagrams demonstrating theoretical physical alterations which take place causing the cell to undergo division.

the routine of these complete little chemical laboratories requires a study of a still more basic component, *the atom*.

We, of the present day, know that throughout the disintegration of all the radioactive agents there are cast off, or emitted, definite electrically charged particles, or electromagnetic waves, and it is through the liberation of such positive atoms, negative electrons, or electromagnetic waves, that the decay of the element is brought about and its transformation into a new and totally different element is accomplished. Knowing this, is there any other explanation for the

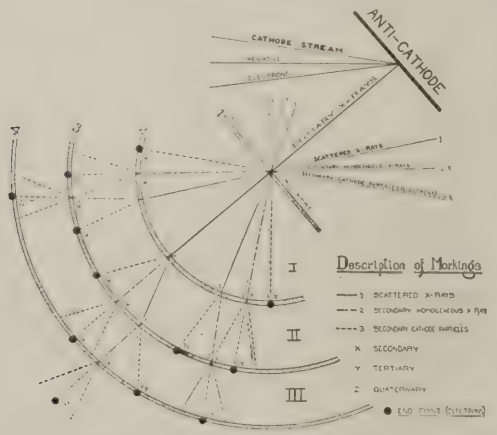

FIG. 3.—Chart illustrating theoretical mode of action of the x ray and necessity of penetrability in the treatment of internal malignancy.

action of these agents other than one of an electrical effect, is there any reason to believe that if unions comparatively stable as those of the elements themselves should be affected by the loss of their atoms, electrons, or electromagnetic waves, that structures so delicately balanced and so fragile as our body cells, should not be far more affected by the action and interaction of such atoms, electrons, or electromagnetic waves, and that by the prolonged and intensified action of these electrical or electromagnetic factors, that the cells coming into direct contact with them must suffer tremendously?

The structure of the radium atom, according to Bohr and other physicists working on this problem, demonstrates a highly complex arrangement of protons and planetary electrons (Fig. 1), yet when the

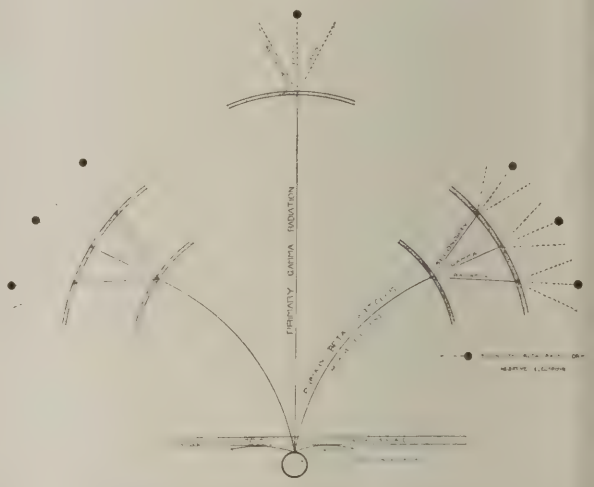

FIG. 4.—Production of negative electrons during the passage of radium rays through the body.

results of their efforts are carefully analyzed and such findings applied to rational physical therapy, I believe the problem can be greatly simplified and utilized so as to bring about results already offering great hopes in our fight against malignant tumors.

Although our subject deals primarily with malignant processes, we must also take into consideration the most fundamental form of cell reproduction, and for this purpose we are forced to consider the natural fertilization of the ovum, for from this union of two

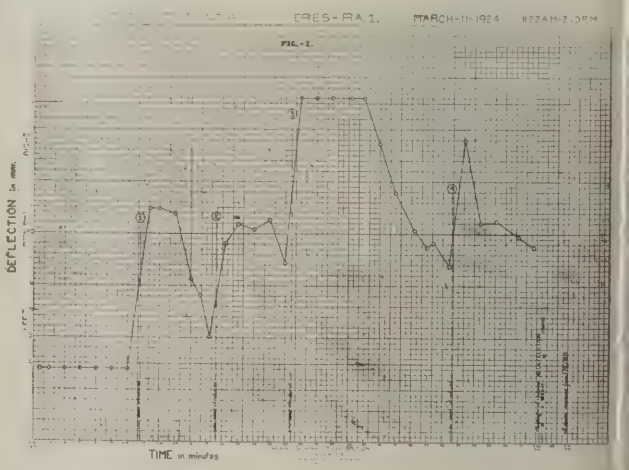

FIG. 5.—Chart illustrating the marked physical effect upon cell potential following the introduction of radium emanation "seeds" into malignant cellular structures. (Note: When coupling wire between animals was removed, no deflection of galvanometer took place).

unit cells (spermatozoon and ovum) our entire bodies are formed and life in its complexities is thereby carried on. Here we have cell reproduction in a far greater excess than is rarely demonstrated in malignancy; here we have cell division induced and stimulated by a known factor, i. e., union of ovum and spermatozoon, here we have two basic components of life which are extremely radiosensi-

tive, and by proper exposure to the rays and radiations from radium or the röntgen tube, sterility of one or both may be brought about, here we have two basic life components of which the chemistry has been quite thoroughly studied and considerable information obtained. Would this not be the logical

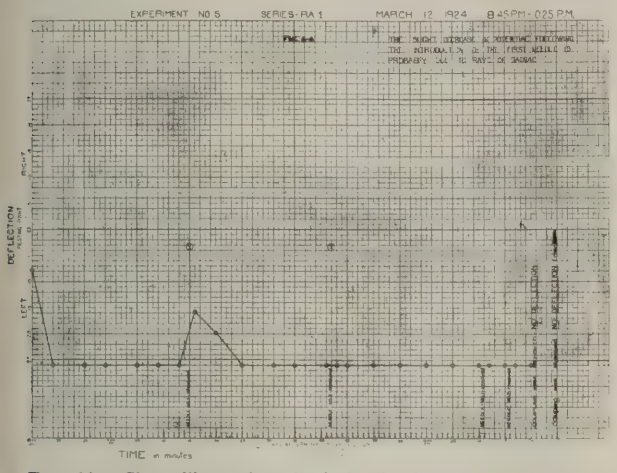

FIG. 6A.—Chart illustrating the lack of effect upon cell potential by the introduction of two, one mg. radium needles.

starting point for an investigation of the mysteries of the stimulated cell division demonstrated in malignancy, and the action of radiations upon such fundamental processes? Is not the study of intracellular metabolism of the individual cell the most promising method of attack, rather than attempting to solve the problem from the study of the gross pathology demonstrated in neoplasia? If we do not study and understand the life and function of the individual cell, how can we hope to explain the processes of anatomical structures, and pathological transformations, which are composed of nothing more or less than huge aggregates of such cellular units?

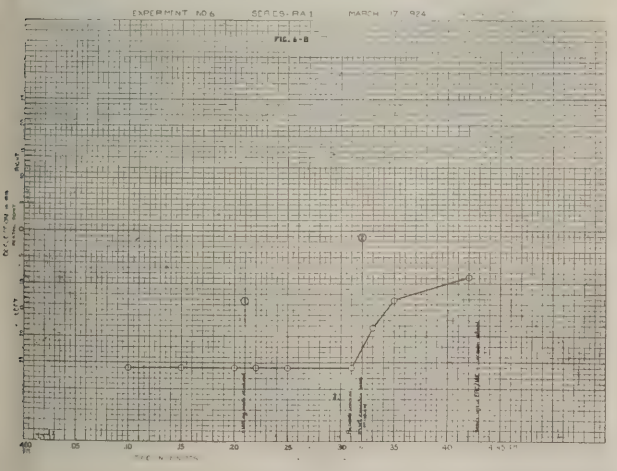

FIG. 6B.—Chart illustrating the lack of effect of gamma radiation and the marked effect upon malignant cellular potential by beta radiation.

Whether or not we support Cohnheim in his explanation of tumor etiology, we must grant that the more embryonal characteristics a tumor presents, the more malignant its nature and less hopeful the resultant prognosis. We must also acknowledge that all malignant neoplasms present in a greater or lesser degree certain embryonal characteristics.

However, the explanation of Cohnheim leaves without explanation several essential points and we are forced to reduce the problem to a far more basic consideration and study. For this purpose a detailed chemical study of the individual cell was made and this in turn reduced to its fundamental basis by

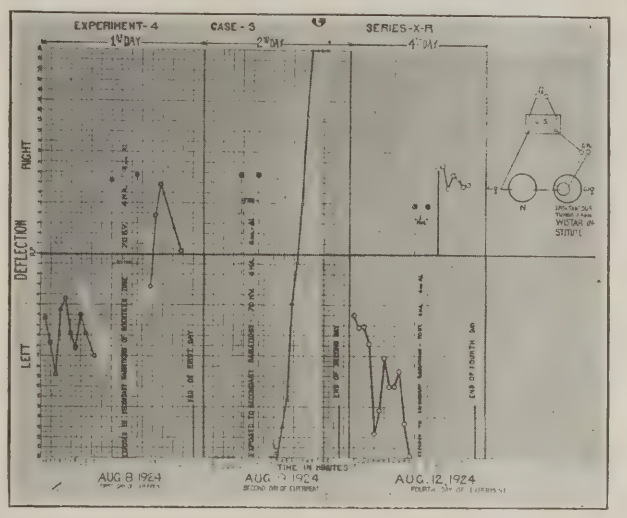

FIG. 7.—Chart illustrating the effect on cell potential under short, repeated exposures to secondary radiations from x ray tube.

a study of the physical or electrical composition and balance of the chemical atoms and molecules comprising the chemical elements involved in the structure of the unit cell.

I shall, at this point, hastily pass over the chemistry of the cell and merely formulate the fundamental facts determined, in order that the remaining portions of this report may be clearly understood.

First, let us consider the chemical composition of the spermatozoon. This structure consists of three distinct parts, namely, the head, neck and tail. The

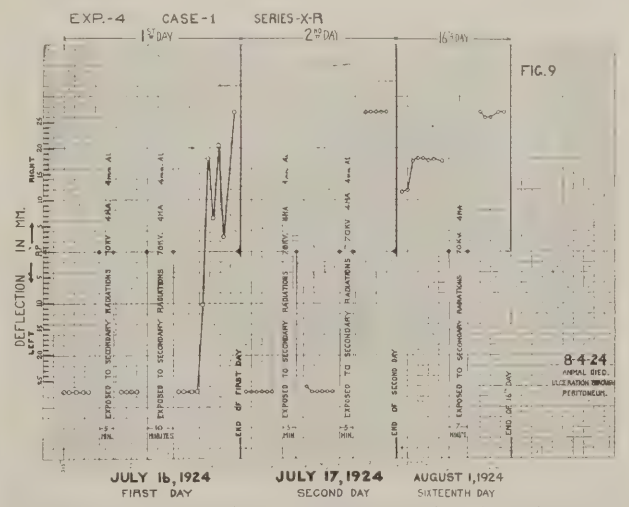

FIG. 9.—Chart illustrating the constant reduction of cellular potential brought about by beta radiation and the resultant "caustic" action of increased beta radiation.

two former alone enter into the process of cytology or spermatogenesis, the tail merely affording a means of propulsion.

For a basic analysis of the nuclear structure of all cells, the sperm head is most suitable, for these structures consist almost entirely of nuclear material, which, although very highly specialized, they are nevertheless nuclei.

After a series of suspendings, centrifugatings, and separatings, the heads are freed from the tails and offer pure nuclear matter for analysis.

The material so obtained is found to consist almost entirely of chromatin, which, upon examination, is found to be composed of two parts; one, an acid portion (nucleic acid); the other, a basic part (some member of the simple proteins). A more basic analysis of these two constituents of cell nuclei demonstrates that the nuclei acid is electronegative while the basic part (protamines or histones) are strongly electropositive, even in faintly alkaline solutions.

Regarding the other element necessary for cytogenesis, the ovum, it, like other unit cells, consists of a nucleus or germinal vesicle, surrounded by protoplasm. These components of the ovum are, as far as is known, of the same structure as those forming the structure, or electrochemic balance of other cells. This being the case we need not repeat the chemical and physical structure of the nucleus, but here merely mention several facts regarding the protoplasm.

The protoplasm consists of approximately seventy to ninety-three per cent. of water, hence the whole structure of this portion of the cell is of colloidal nature. All protoplasm contains an aqueous solution of common salts, and as we know, the outstanding property of salt solutions is their ability to conduct the electric current.

When the electric current is passed through protoplasm, accumulation of positive particles takes place at one point and of negative at another, the positive going to the cathode, while the negative accumulate around the anode. Since only electrically charged particles move with or against the current, the colloidal particles forming the protoplasm must be charged.

The points just formulated demonstrate that the protoplasm, like the nucleus, is composed of an electropositive and an electronegative portion, which, in the normal, resting cell is delicately and accurately balanced so as to carry out its portion of the cell's duty.

As shown in a preceding paragraph, the medium through which these positive and negative particles or portions interchange is well planned for electrochemical function of the cell, and the whole organism is a complete and powerful electrochemical unit. This reasoning cannot be denied, therefore why should we view with skepticism the idea that anything affecting this intracellular metabolism also being of electrical nature, or that the action of the agents used to combat altered intracellular mechanism must exert their influence by the physical or electrical structure and radiations.

Such physical agents not only exert their influence in the stimulated cell propagation demonstrated in malignant tumors but also upon the more rapidly multiplying cells which enter into the formation and development of the embryo. The work of past investigators has shown us that the growth of the embryo is retarded by radiation, and displays irregularities of development. Monstrosities have also been noted following irradiated embryos.

Now in order to simplify our problem, let us ask ourselves three questions which require answer before any rational explanation as to cause and treatment of cancer can be satisfied.

First: What is the alteration which takes place, causing a cell to undergo division? This I will attempt to demonstrate in a very brief manner by means of Fig. 2.

Second: What is the difference between normal cell division and that of the unrestricted cancer cell? This question has been quite thoroughly covered in several of my previous publications and need not be repeated at this time (1).

Third: A question previously referred to, but one which I believe cannot be too strongly emphasized, i. e., what is the sublethal effect of the various physical agents on normal and abnormal cell division? This will form the text for the balance of this report, and although the work is far from complete, I believe it has placed x ray and radium therapy upon a far more rational and fundamental basis.

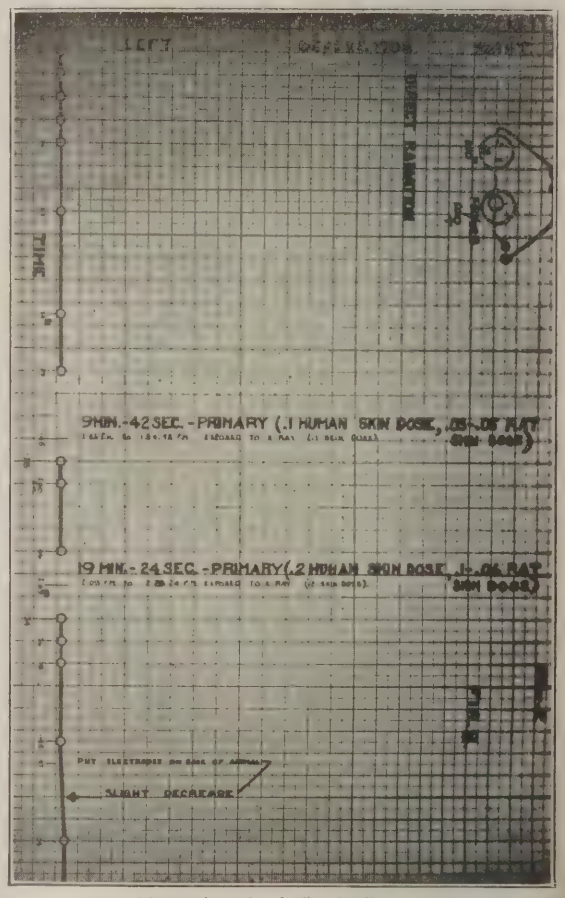
LEFT
TIME
9 MIN.-42 SEC.-PRIMARY (.1 HUMAN SKIN DOSE, .05-.06 RAT SKIN DOSE)
19 MIN.-24 SEC.-PRIMARY (.2 HUMAN SKIN DOSE, .1-.06 RAT SKIN DOSE)
SLIGHT DECREASE

Fig. 8.—Chart illustrating the lack of effect on cell potential by primary x radiation. The slight decrease in potential shown at the extreme right demonstrates the production of secondary radiations by passage of the primary beam through the body of the animal.

In answer to the first of the above questions, it has already been stated that all unit cells possess a nucleus and protoplasm, the former being electropositive as compared to the latter.

Now, with the fertilization of the egg by the spermatozoon, we might say that the bulk of the ovum is composed of electronegative material (protoplasm) although, like other cells, it possesses a positive element, the nucleus. When attacked by the spermatozoon, it is done so by a strong electropositive element, for, as previously outlined, the essential part of the spermatozoon entering the protoplasm of the ovum is the head, and composed of almost pure nuclear material.

Under these conditions we have the electrically balanced forces of the ovum (nucleus and protoplasm) stimulated to cytogenetic change by the addition of an electropositive agent. The nucleus of the ovum rapidly disappears and intermingles with the protoplasmic elements, and the whole structure at this stage exists in a strong electropositive state. Immediately following this initial stimulation, and transformation, the cell rapidly undergoes the various stages of division to form daughter cells.

It is quite natural that one should inquire into the nature of the force necessary for continuance of the process following the initial stimulus, and of the regulating force which enables this tremendous cell reproduction to be brought to a close, or at least modified and held in restraint.

The discussion of a question so involved as this cannot be presented in a condensed manner, so I will refrain from any such consideration in this report, however, this will be discussed fully in a later publication.

From the lengthy introduction to the experimental findings which form the body of this report, one is impressed with the idea that the cells comprising malignant tumors must exist in an electropositive state as compared to the normal, resting cell. *This I have found to be true by repeated animal experiments with many forms of experimental tumors, in vivo.* These experiments were subjected to the most strenuous forms of observation, and many factors were incorporated in order to offset the possibility of experimental error or misinterpretation of results obtained.

By means of a high sensitivity galvanometer, I have found, in some three hundred cases studied, that the tumor mass possessed a greater or higher potential than normal tissue.

Analysis of the radiations emitted from the element radium, shows the presence of three rays, two of which are definitely charged particles:

1. The alpha particles, or positively charged helium atoms. These have a wave length of about five cm. (the greatest range being 8.6 cm., which is that of the alpha particles from thorium C_2). These particles are readily absorbed, the thinnest walls of any container for radium application will easily eliminate their passage. Therefore we may disregard such particles as having any therapeutic value.

Allow me at this point to say that a series of experiments has been started whereby it is my hope to induce tumor formation by the action of the alpha particles emitted from polonium, or radium F.

This work offers encouraging results, as sections taken from areas immediately surrounding the polonium needles demonstrates structural abnormalities resembling those of the early stages of cells undergoing malignant transformation. However there are two important factors entering into this investigation which will make it one of considerable length before definite results can be reported. This experiment was carefully controlled by placing victrola needles, under the same experimental conditions as the polonium needles, into normal control animals.

The factors requiring consideration are:

First: That the penetrability of the alpha particles being so small, comparatively few are able to penetrate the protoplasm of the cell and react upon the nucleus. Only those immediately surrounding the polonium surface would be within range of the emitted particles.

Second: That the period of activity of the polonium being of such short duration (half decay period being about 136 days) only the cells immediately surrounding the surface of the needle would be stimulated by the emitted alpha particles, and sufficient time of exposure would have to elapse before such cells could adopt the metabolism and habit chemistry of the electrochemical typical cancer cell. It must also be remembered that during this and subsequent times, there is a comparatively rapid loss of activity or alpha ray output.

Our problem is now reduced to the study of the remaining emissions from the element radium, i. e., the beta particles, and the gamma rays.

The beta particles consist of negatively charged particles, or negative electrons, having a penetrating power of about one hundred times that of the alpha particles. The beta rays, upon their passage through matter give rise to a type of gamma radiation, which in turn, upon further passage through the medium give rise to secondary beta rays, or negative electrons.

The gamma rays are electromagnetic waves with a velocity equivalent to that of light. These rays are not deflected by a magnet and have a penetrating power ten to one hundred times that of the beta particles. As the gamma rays pass through matter a part of the original beam is scattered in all directions, giving rise to secondary gamma rays and secondary rays of the beta ray type. These secondary beta rays have a penetrating power nearly equivalent to the primary beta rays. It seems quite possible were the thickness of traversed tissue sufficiently great, that the secondary gamma rays formed by the splitting of the primary beam, would eventually give rise to tertiary beta rays, with greatly decreased power of penetration.

These three forms of radiation from radium find their parallel in radiations from the röntgen tube, differing only in mode of origin, and to some extent in penetrability. However, that does not alter the fact that electrically, these radiations, from two distinct sources, are identical. Thus in the scattering of rays and radiations from either radium or the röntgen tube, the end product is the formation of negative electrons, and it is upon this fact that this research is based (Figs. 3 and 4).

In a recent publication, the results of an extensive research of the biophysical effects of the rays and radiations from radium were fully discussed (2). The important points advanced in this report were as follows:

First.—That the beta particles, or negative electrons, are the ones responsible for biological cell change, and these, by neutralizing the excess potential within the tumor cells, bring about their desired and selfpossessed therapeutic action, by repeated small doses of screened radium, or radium emanation, rather than the large and continuous doses heretofore employed (Fig. 5).

Second.—That a continued negative state of physical unbalance within the cell will result in inhibition of cellular activities, and an eventual cell death.

Third.—That the biological action of gamma

radiation is practically nil, and the noteworthy feature in the treatment of malignant neoplasms is their penetrability and vehicle or excitant for secondary beta rays, or negative electrons. This was demonstrated most conclusively by experiment (Fig. 6—A and B).

Fourth.—In all probability, the burning, ulceration and constitutional reactions developing as the result of long, continued and intense radiation is the result of the continued physical action of the primary or secondary beta rays, or negative electrons (compare with 2). This has been proved by our experimental and clinical findings.

Fifth.—The nausea, vomiting, depression, and other symptoms following large doses of radium is due, to a great extent, to the absorption of the products of cell death by the entire organism.

As stated in a previous paragraph, such radiations as emitted from the radioactive element radium have their analogies in radiations from the röntgen tube:

1. The canal rays consist, under certain conditions, of positively charged helium atoms, which are low velocity alpha particles.

2. The particles of the cathode stream are low velocity electrons, i. e., slow beta particles, or negative electrons.

3. The x rays are, as far as is known, identical with the gamma rays.

Now in order to further substantiate our experimental findings of the biological action of the beta rays, or negative electrons from radium or radium emanation (niton), and in an effort to bring to light a more detailed knowledge of the basic action of radiations from the röntgen tube in the treatment of malignant processes, an extensive physical and clinical study of the secondary radiations from the röntgen tube was undertaken. The theoretical aspect of this investigation was covered in an earlier publication (3).

This investigation has yielded extremely interesting findings and we now believe that with a more detailed study of the secondary radiations, or negative electrons, together with a more perfected technic, that the ravaging processes of malignancy may be held in check, and succumb to the power of this physical agent.

We are now directing our efforts toward a technic whereby the primary beam is scattered, giving rise to its secondary rays and radiations. Knowing that the secondary cathode particles so formed are electrically charged particles, or negative electrons, we hope to be able to make use of this property and direct or attract such particles to the desired locality by means of proper magnetic forces.

By animal experimentation we have found that the secondary rays alone produce any initial effect upon the increased potential demonstrated by tumor masses (Fig. 7). This was previously found to be a property of the beta rays from radium (Fig. 5).

Corroborating the findings of the lack of effect of gamma rays from radium upon increased potential of tumor cells, we have found that the primary beam of x rays bring about no alteration of potential in such structures except after they have penetrated sufficient material to give rise to their secondary radiations (Fig. 8).

Verifying the theory and subsequent experimental findings, that a continued negative state of cellular reactivity will eventually result in ulceration and sloughing, we have found that neoplastic tissue, once treated with an antidotal dose of secondary radiation, will, upon further treatment, display a reversed reaction, and if maintained in this state of physical unbalance, will readily ulcerate, with an eventual outcome of death to the animal so treated (Fig. 9).

Animals treated with a sufficient dose of secondary radiation to bring about a balanced potential of neoplastic and normal, demonstrated marked beneficial local and constitutional results.

As the clinical results following such treatment as suggested in this report will be covered in a detailed manner in a paper by my associate, J. W. Frank, M.D., I will refrain from infringing upon his report, but here merely mention that physical alteration of the cell balance was brought about only by the negative electron.

The way in which the electron exerts its influence within the cell can only be answered by hypothesis, and in concluding this report I will attempt to outline very briefly a possible explanation of its behavior within the body cell.

As far back as 600 B.C., the phenomenon of electrostatic attraction was observed. In 100 A.D., Plutarch recorded that a piece of lodestone sometimes attracted and sometimes repelled iron. Observations from these dates on have brought about the establishment of the law, "unlike poles attract" and "like poles repel."

In our present century, Bohr (4), in describing the structure of the hydrogen atom, states, "we could indeed hardly conceive of a system composed of four positive hydrogen nuclei alone, for the forces of repulsion would soon drive the separate parts asunder. The two electrons can, so to speak, serve to hold the system together."

Applying the laws of attraction and repulsion to the electrical structure of the cell as outlined in this report, we may view the entire problem as based on such fundamental principles.

With increasing potential of the cell there naturally results an accumulation of positive elements. The cell, like the atom, requires a definite balance of protons (positive elements) and electrons (negative elements), some electrons associated with the positive elements of the nucleus but the bulk surrounding it.

Drawing such a comparison, we could no more expect the cell to be held together, when once this balance of protons and electrons is disturbed, than we could the atom. Therefore, with an increasing positive state of the nucleus, the nuclear elements are repelled, and the cell undergoes division. This may account for the usual rapid progress of sarcoma as compared with carcinoma, for cells supported by the structures which are usually the site of sarcomata, requires a greater physical or electrical alteration before the necessary stimulation could be brought about. The alteration once produced, the cells propagate and proliferate at an astonishing rate.

If the negative electron is the one responsible for correction of such malignant processes, and from theoretical reasoning and actual experimental findings this is found to be true, it is our goal to place into the cell only enough electrons to balance the in-

crease of positive elements, thereby holding the system together.

In cases demonstrating the caustic action of radium and the x rays, I believe that with excessive doses we are so saturating the cells with negative electrons that the forces of repulsion drive the separate parts of the cytoplasm asunder; the nucleus, then positive, and existing by itself, is not held together by the negative forces of the cytoplasm and therefore disintegrates. Or perhaps the planetary electrons from an atom of radium so saturate the entire cell as to cause complete disorganization of the cell components.

The mode of action, or mechanism, of the electron within the body structures (or within the individual cells, if possible) will form an extensive and important part of our remaining research; and it is our hope and desire to be able to acquire a more basic knowledge of this physical agent, for it is only through such a knowledge that x ray and radium therapy will be put upon the sound foundation so imperative in our fight against cancer.

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Experimental and Clinical Evidence Supporting the Action of the Secondary Radiations from the Röntgen Tube in the Treatment of Malignant Processes

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In the early years of the x ray era many difficulties were encountered; this was apparent to all clinicians but especially so to those in direct contact with the work. These difficulties for the purpose of study may be divided into two main groups: First, inadequate apparatus, and second, lack of a scientific basis as a guide for therapeutic application of the rays.

The first stumbling block has been ably handled by the commercial part of the profession. (I classify these men as part of the profession because they have been instrumental in advancing the science in no small degree.)

The early work was of necessity done with crude instruments such as static machines and coils as a primary source of power. Gas tubes with their ever changing degrees of vacuum, resulting in mixed wave lengths and varying degrees of penetration, thus making it almost impossible to determine the exact amount of radiation reaching the involved pathology. This has happily been overcome by the intervention of the hot cathode tube by Coolidge in 1912 and the improved generating plants giving outputs as high as 300,000 volts thereby placing in our hands apparatus capable of developing extremely high penetrating rays, always under the control of the operator.

Second—In spite of the enormous amount of work done and the results accomplished there was nothing that we could recognize as a definite law of therapeutics; the reason for this is indeed obvious, there being no basic knowledge as to the nature of cancer, therefore not knowing its fundamental abnormalities no definite technic could be evolved.

The reported researches of Butts (1) have thrown considerable light on the biophysical and chemical nature of cancer and now we feel we are on the verge of formulating a scientific rule of therapeutic application which will result in relief if not the ultimate cure of the cancer victim.

In our experimentations we found that the secondary rays were the most beneficial, and that the overwhelming excess of negative electrons produced by the splitting of the primary beam was the ultimate cause of the intense sloughing following prolonged treatments, so that at present we make use of the secondary rays in all of our work, the results of which are offered in a more or less preliminary manner in this report.

The aim of radiologists in the past has been to apply as much radiation to the cancerous growth as possible; this was limited by the effect on the skin. Filters were then introduced, being interposed between the tube and the patient, their function being to filter out the low penetrating rays that would act only on the skin, and not the deeper tissues, thereby allowing more of the deeper penetrating rays to reach the mass. Then followed the cross fire method, this to increase the total amount of radiation to reach the cancer, always figuring that it was necessary to apply 110 to 120 per cent. of a skin dose to the growth; this was considered the lethal dose for carcinoma and it was believed this was the ultimate goal to be reached. We now know it is not necessary to give a dose sufficient to kill the neoplastic cell.

From our experiments it has been demonstrated that it is not the caustic action of the rays that is beneficial but the action of the negative electron, conveyed by the secondary rays, which will bring about a balanced electrical condition of the cell, thereby controlling cell energy and metabolism and by this means arresting the cancerous proliferation.

As to the best method of producing and applying the secondary rays much work needs to be done in order to perfect a technic bearing out the application of such radiations, but directed to meet the requirements of the individual case. Two methods employed in my laboratory are formulated as follows:

Method I: 70 K.V., 4 ma., 12″ distance, 4 mm. aluminum and 3.2 c.m. of paraffine 12-20 min.

Method II: 70 K.V., 4 ma., 4 mm. aluminum, 12″ distance for 12-20 min. and pass the beam through 12-14 cm. of paraffine, one edge of which is about 1 c.m. from the primary beam, this giving

Fig. 1

Fig. 2

Fig. 1.—Photograph of rat bearing Flexner rat carcinoma, taken July 18, 1924. Size of tumor on this date, 5.2 c.m. by 2.6 c.m. Animal thin and anemic.

Fig. 2.—Photograph taken July 23, 1924 of same rat as illustrated in Fig. 1. Animal has received twenty-five minutes of secondary radiation. Size of tumor on this date, 2.5 c.m. by 1.5 c.m. General condition markedly improved.

off principally secondary rays, the primary beam not touching the patient; this latter method we feel is the best way to reach the cell to change it to one of neutral reaction and has been employed almost exclusively throughout the animal experiments.

In the deep seated growths our efforts are directed in such manner that the secondary rays are produced in the tissues immediately surrounding and within the mass. All the experiments have been accurately checked in the following manner:

Each case was photographed and röntgenographed, after which a section was taken for microscopical examination, the animal was then coupled with a normal control and reactions tested by means of the high sensitivity galvanometer to determine the potential difference demonstrated by the neoplastic and normal tissue prior to and following secondary radiations.

It was found that doses as described under the second method reversed the current flow displayed at the onset of the experiments. If such alteration was not brought about as a result of such exposure the animal was either subjected to further treatment at this time or the experiment discontinued until the following day, whereupon we found that very short exposures produced rapid reversion in current flow, demonstrating that the tumor mass formerly with a greater potential now displayed the effect and physical action of the electron.

With the maintenance of a decreased potential, or in other words a balanced equilibrium, or ionization, marked atrophy of the tumor mass resulted; however, with a continued negative state of the mass so treated, extensive sloughing and ulceration, followed by the death of the animal resulted. Animals treated with a neutralizing or antidotal exposure of secondary radiation showed rapid constitutional as well as local effects, the anemia and cachexia rapidly disappearing, accompanied by an increase in body weight and associated with all the activities and vigor of the normal controls.

The investigations of Butts (4) demonstrate that all carcinomatous masses deflect the galvanometer to the positive side thereby showing a higher electrical potential in contrast to the normal body cells which are endowed with a well balanced or neutral reaction. This being true it primarily remains for us to apply a force that will reduce the excess potential to the neutral reaction of the normal cell; this force we have found to exist in secondary radiations.

The use of these rays in our animal experimentation brought about such noticeable and beneficial changes in the carcinomatous masses (as shown by Figs. 1, 2, 3, 4) that we have been applying them clinically to the exclusion of the primary beam wherever possible, results of which we hope to be able to report on more fully in the near future.

A research as extensive as this requires the maintenance and employment of many animals, born and bred under the most careful experimental conditions. Rats must be inoculated with the standard strains of laboratory tumors, and besides these, control rats of the same age, strain and litter are necessary.

In an effort to control our experiments with the greatest degree of accuracy we have constructed cages of sufficient size to accommodate two animals. In each cage two brothers or two sisters of the same litter are placed.

These cages are built so that the animals are maintained under identical conditions of living and diet, and assuring ample room for exercise and the most pleasant environmental conditions.

The tumors now established in my laboratory are the Flexner rat carcinoma and rat sarcoma No. 10, besides various types of spontaneous tumors (Figs. 5, 6, 7, 8) received through the kindness of the Wistar Institute of Anatomy and Biology. This selection of tumors afford ample material for a thorough study of our problem, for it is absolutely essential that any theory as to cause and treatment of cancer must also cover all types of tumor formation.

All rats used throughout this investigation are from the Wistar Institute colony and in using animals from such a source we are assured of exact date of birth, and of the animals being free from any previous pathological condition or the presence of external parasites.

Fig. 5.—Lipoma.

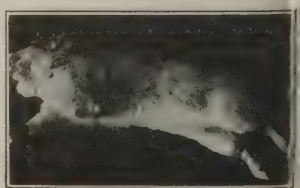

Fig. 7.—Adenoma.

The tumors are transplanted from one animal to another by the method devised by Butts (5) which usually assures a high percentage of successful grafts without loss of tumor bearing anmials or identity of the tumor type. In about two or three weeks the tumors have developed, if the graft has proved successful, and from this time on offer suitable material for our work, depending upon the stage of tumor development required.

Following out the leads as shown by our experimental work previously mentioned we are now applying them clinically, and have under treatment a number of cases which are showing marked improve-

FIG. 3

FIG. 4

FIG. 6

FIG. 3.—Radiograph of rat illustrated in Fig. 1, taken July 18, 1924. Area I illustrates the area of necrosis. Area II, which extends on both sides of the necrotic portion, is the area involved by rapidly growing neoplastic tissue.

FIG. 4.—Radiograph of same rat as Figs. 1, 2, 3, taken July 28, 1924, at which time only a small area of necrosis could be detected, and the entire area occupied by the carcinomatous tissue had disappeared.

FIG. 6.—Radiograph of rat illustrated in Fig. 5, showing extent of lipoma.

ment, some of which under the older technic did not respond, in fact many became worse from the excessive exhibition of negative electrons.

CONCLUSIONS

1. That the older form of treatment with the filtered primary beam would sometimes result in relieving the patient and prolonging life, others treated would not be benefited. The results obtained by such forms of treatment we believe entirely dependent upon the natural liberation of secondary rays created by the passage of the primary beam. In this method of therapy benefit or failure depended upon three factors enumerated as follows: First, that in some cases so treated the primary beam passes through the involved pathology without liberating sufficient secondary radiations to be of any actual benefit. In such cases there would naturally be little, if any cellular response to radiation. Secondly, the primary beam in its passage through the treated area liberated sufficient electrons to bring about marked alteration (antidotal dose), and benefit in the pathology so treated. It was such exposures as these that held out hope for the x ray in the treatment of malignancy. Thirdly, that the ulceration and sloughing so often experienced was due to the liberation of a greater excess of electrons than was demanded for the beneficial action of x ray therapy.

FIG. 8.—Radiograph of animal illustrated in Fig. 7, showing extent of adenoma.

2. That this was due to excessive radiation with primary negative electrons.

3. That the physical nature of cancer is shown by the increased potential of its cells.

4. That this increased potential can readily be changed to a normal balance by applying neutralizing or antidotal doses of secondary radiations.

5. When secondary radiations were so applied, all animals showed an almost immediate local and constitutional benefit.

6. That the benefit noted in the animals will also be manifested in humans, as already shown by a number of clinical cases under treatment and close observation.

A table[1] has been prepared consisting of a composite of twenty-seven cases now under treatment with an increased secondary ray production from the röntgen tube. A number of these cases were inoperable and advanced beyond the stage where radium therapy was advisable. Many of the cases reported in this table had completely failed to respond to the old form of x ray therapy. Twenty-one of the twenty-seven patients have demonstrated marked local and general improvement, responding almost immediately to the treatment with increased secondary radiations, and all have shown improvement to a noticeable degree.

[1]This table with a complete list of references will appear in the author's reprints.

A Case of Lateral Sinus Thrombophlebitis

Recovery Without Operation

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That thrombophlebitis of the lateral sinus is almost invariably fatal, when unoperated, is admitted by everybody. Yet there are a number of cases, larger perhaps than we are inclined to think, in which a spontaneous cure takes place. This may be brought about in one of two ways:

1. The ends of the sinus are shut off by a thrombus, while the outer wall of the intervening portion breaks down and the pus is discharged into the mastoid, drainage taking place either through the middle ear, through a mastoid operative wound or through a fistula in the mastoid wall. Friedenwald reports a case in which the pus was evacuated through the emissary vein, which served as the fistulous tract, while the sinus was shut off from the circulation by firm clots.

2. The thrombus in the sinus may become organized. In this group the infection is usually of a low grade permitting organization. Ewing W. Day reports six cases of sinus thrombosis with mild symptoms which were unsuspected, but were found during mastoid operation. In these cases the sinus was filled with an organized clot. Rarely even malignant cases may show organization and sometimes even recanalization. Haymann reports a case of otitic meningitis in which autopsy revealed the sinus obliterated by organized connective tissue, showing undoubted evidence of recanalization.

In the cases reported in the literature the diagnosis was established either at autopsy or accidentally while doing a mastoidectomy. Friedenwald reports another case in which the outer wall of the sinus was found destroyed and the lower end collapsed. He also collects the following cases from the literature:

Griesinger, Schwartz, Alt, Politzer, Baufal and others found complete obliteration of the sinus at autopsy. Alexander, Ucherman, Blau, Uffenorde, Streit, Welty, Auerbach and others report cases which ran a nonfebrile course and in which the sinus was found obliterated at operation.

In the case here reported we have not been so fortunate, as the mastoid operation was done before the onset of symptoms pointing to sinus involvement. Even the blood culture was persistently negative. In this case also the symptoms were unusually severe, the patient seemed to be suffering from a very severe pyemic infection, lasting a long time, and her chances for recovery seemed doubtful.

CASE.—B. M., female, aged thirty-five, was admitted to Dr. Hubby's service at the Harlem Hospital on February 14, 1922, giving the following history: Ten days before admission patient had rightsided earache. Two days later the drum was incised by a private physician. On account of failure to discharge and beginning mastoid pain the drum was again incised six days later. This was followed by a profuse purulent discharge.

On admission, examination revealed the following: The left ear was normal. The right concha was red and swollen (the patient thought this was due to a hot water bag burn). There was a profuse purulent discharge from the right ear, the drum looked red and boggy and the posterosuperior wall was perceptibly sagging. There was marked tenderness over the mastoid region especially severe over the tip. The temperature was 101.2°.

By evening the temperature had risen to 104.8° and the differential count showed white blood cells 12,000, polymorphonuclears eighty-four per cent., lymphocytes sixteen per cent. Operation was decided on and a simple mastoidectomy was done the same evening. While elevating the periosteum, the mastoid emissary vein was injured causing rather profuse bleeding, which was soon controlled. The mastoid tip was necrotic and full of pus. The bony wall of the sinus was not injured and left intact.

After operation the temperature rose still higher and remained steadily high for four days between 102.5° and 105.5°. The blood count showed white blood cells 9,000, polymorphonuclears eighty-two per cent., lymphocytes eighteen per cent. The patient complained of headache. About this time the skin in front and behind the ear became red and swollen and erysipelas was suspected; but this diagnosis was not positively established until the seventh day, by which time the infection had spread over the scalp to the left ear. This put our fear of thrombosis at rest temporarily.

On the fifth day the temperature dropped suddenly from 104° to 97.4°, and thereafter fluctuated widely between normal and 107° with chills and sweats. On the thirteenth day the erysipelas had reached the left cheek, when all advance ceased coincident with a gradual fading of the redness. At this time also the patient complained of severe pain and tenderness in the right gluteal region. The differential count was white blood cells 8,600, polymorphonuclears seventy-eight per cent., lymphocytes twenty-two per cent.

The persistence of the fluctuating temperature, the severe chills, the profuse sweats, the possibility of secondary abscess in the gluteal region and the cessation of the erysipelas turned our suspicions to the sinus once more. A second and third blood culture taken on the thirteenth and sixteenth days respectively were negative.

About the beginning of the third week after operation the patient complained of pain about the mastoid wound. The region about the emissary vein became edematous and one could feel a tender cord running from the mastoid along the border of the sternomastoid muscle. The blood count was white blood cells 12,600, polymorphonuclears, eighty-seven per cent., lymphocytes thirteen per cent. It might be stated here that repeated careful examinations revealed no other cause for the temperature.

The fact that the patient did not seem extremely septic during the whole course of her illness, that her general condition was always fairly good and that the gluteal pain was subsiding, made us decide against operating, great as was our temptation to do so. To our great surprise and satisfaction the temperature dropped to normal on the twenty-first day and remained there, the patient being able to leave the hospital four weeks after operation.

In arriving at a diagnosis the complicating erysipelas proved to be a stumbling block for a time. However, the fact that all signs of advance of the erysipelas had ceased after the thirteenth day, while the septic temperature persisted until the twenty-first day, and also that the temperature in erysipelas is not of this widely fluctuating type, soon ruled out this affection as one of diagnostic significance.

Although we made the diagnosis of thrombophlebitis with some hesitancy, we feel that all the signs and symptoms that we were able to obtain pointed to such a cause. If we were asked why we did not operate, we would have to admit that we do not know, except that circumstances made us hesitate at first, and the longer we waited the less inclined we were to interfere.

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The Occluded Fallopian Tube and Its Relation to Cervical Infection*

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Female sterility, notwithstanding advances made in recent years, continues to present many baffling problems to the gynecologist. Much has been done in almost every branch of medicine to aid in the solving of this condition which often assumes so many mysterious aspects. Volumes have been written about sterility but we stand today practically helpless in the majority of cases. Notwithstanding the abortive results obtained in the therapeutic field much has been accomplished in the diagnosis and prognosis of sterility. The problem here is in every respect one of cause and effect. Find the cause and the problem is usually solved.

Among the many notable advances in the past few years, the insufflation test for the determination of the patency of the fallopian tubes undoubtedly ranks highest. It has revealed the fallopian tubes in their true light, as a distinct clinical, pathological entity, and has helped demonstrate, with comparative ease and safety, conditions that formerly required laparotomies for their recognition. It has enabled us to ascertain with assurance, the possibility or improbability of relieving a common condition. The Rubin test, other conditions being favorable, should be used in every case of sterility before relief for its correction is attempted, especially before any abdominal surgical procedure is advised.

Omitting in this short paper all those cases of sterility that have as their basic cause some definite gross anatomical deformity or gross pathological abnormality, such as congenital defects, new growths, pelvic displacements, inflammatory masses in the adnexæ, and other constitutional factors, our theme here concerns itself with those sterile women in whom bimanual examination fails to reveal any of these conditions. The histories given by these patients are almost identical in their character. A slight discharge before marriage, somewhat more profuse after sexual relations have been established, perhaps dysmenorrhea in some cases, and sterility. Examination reveals uteri freely movable, adnexæ apparently not the seat of inflammations or inflammatory exudates, the Rubin test, however, disclosing nonpatent tubes. In many thousands of such cases tested, it has been definitely established that approximately between forty per cent. and forty-five per cent. of the patients have tubal obstruction.

Where abnormalities or deformities are present and can be diagnosed, the problem of their correction assumes a much simpler aspect, and the possibility of a cure by the employment of the proper corrective measures suitable to such deformities should be tried, and a reasonable assurance of success expected. This is particularly true of patients in whom conditions in the fundus uteri are the predominating etiological factors. Where gross pathological conditions in the adnexæ are diagnosed, the possibility of relieving sterility is rather remote, although many cases are at hand in which conservative treatment was followed by conception. This may often take place in undoubted cases of gonorrheal pyosalpinx. Such instances are rare, however, and it can be stated that, as a rule, tubal occlusion invariably follows severe adnexal disease. This occlusion often accounts for the alternate filling and emptying so frequently observed in pyosalpinx, hydrosalpinx, and other conditions. It may be stated in passing that conservative treatment in this group should be the method of choice, and, when feasible, the etiological factors sought for and eradicated.

A more difficult problem revolves about that group in which physical examination reveals no abnormality in the fundus or in the adnexæ. The Rubin test, however, discloses the tubes to be nonpatent. Shall we inform such patients that the condition as found is a relatively hopeless one, or shall we advise surgical measures to overcome the obstruction and render the tubes patent? And, if surgery, what measures shall be pursued to afford at least a reasonable hope of success? Within the past several years, salpingostomy and various other plastic operative measures on the fallopian tubes have been advised, and assertions have been made that from twenty per cent. to fifty per cent. of such surgical measures were successful, and conception occurred in due course of time. Such statements bring to mind the phenome-

*Read before the Bronx Gynecological and Obstetrical Society, March, 1924.

nal cures formerly attributed to dilatation and curettage, the use of the stem pessary and the various other panaceas broadcast far and wide as cures for sterility, only to pass into oblivion, and it seems that we are about to traverse the same path, employing at this time a vehicle more complicated, more intricate and much more dangerous.

Many causes operate to defeat successful surgical plastic work on such fallopian tubes. Among them may be mentioned the manipulations of the tube incident to this type of work, with the subsequent postoperative adhesions, the attempt at loosening old adhesions leading only to the formation of firmer and denser bands, the frequency of reinfection from below, and the tendency on the part of nature, nearly always constant, to seal up the tubal stump with a plastic exudate soon after the closure of the abdomen. Individually each is of sufficient importance to bring about failure in so delicate an operation. Finally defeat is inevitable snce such attempts at correction omit and ignore the basic etiological factors concerned in the production of such tubal obstructions. These surgical measures are both unscientific and unsurgical, since little cognizance is taken of the fact that occlusion of the tube is seldom, if ever, primary, and is nearly always the result of a preexisting infection from the lower genital tract, which in itself is often sufficient to cause sterility. The recognition of this fact and the full knowledge of its significance would materially lessen the incidence of such operations.

Omitting from this group the small number of cases of tuberculous adnexitis, and those in which tubal occlusion can be definitely shown to be the result of a previous suppurative appendicitis, it can be stated that in the main these tubal obstructions are brought about and are the result of infections from below. This holds true in both primary and relative sterility. The pathological picture present in cases of relative sterility is simple to understand, and the infections incident to the traumatisms of childbirth are quite familiar. Much the same can be said for these insidious infections, that ultimately follow dilatation and curettage. The primary sterile women with little or no history to guide one, presents an almost similar pathology as far as the infection is concerned, perhaps not so marked, but with corresponding end results. In both classes the obstruction is definitely due to an infection.

The microorganisms usually responsible for this infection are the gonococcus, the staphylococcus and the streptococcus. They easily find their way into the genital tract and here meet favorable media for their propagation. This is as true in early childhood as it is in adult life, and the vulvovaginitis of children is rather a cervicitis than a vaginitis. In later life the incidence of infection is more frequent, and cervical infections are the commonest of all lesions found in the entire realm of gynecological pathology. Anatomically and histologically the cervical canal is ideally adapted to receive and maintain these germs. They find their way into the ducts of the racemose glands that honeycomb the cervix, and penetrate deep into the glandular tissue itself, remaining here for years or even a lifetime. The acute stage of the infection is readily tolerated by the patient as a rule, and may last only a short time. It progresses however insidiously, soon assumes the chronic form, and presents the clinical picture of chronic endocervicitis. Various pathological pictures may be seen, ranging from the case that shows little or no cellular destruction of the vaginal mucous membrane, and where the infection is confined wholly within the cervical canal, to the marked destructive processes that manifest themselves in the socalled erosions and ulcers. Although these changes depend upon the degree of virulence present, the end results, to all intents and purposes, are similar.

Leucorrheal discharge is present in all cases, and the history of such a discharge is sufficient in itself to make a diagnosis of endocervicitis. This discharge is an attempt on the part of nature to throw off the products of inflammation, but unfortunately the drainage is nearly always inadequate and little is accomplished. The normal character of the cervical discharge is altered, becoming thick, inspissated, sticky, and its chemical reaction changed. Examination of the secretion taken from the cervix after coitus without condom, often shows that not only are the spermatozoa frequently killed when the reaction is acid, but will disclose them entangled and enmeshed in this inspissated discharge, unable to make headway through this mass of pus and mucous. It is, therefore, not unreasonable to say that a progressive endocervicitis is frequently the first and only link in the chain of circumstances that ends in sterility, and that this condition is well established long before involvement of the tubes has taken place. The futility of abdominal surgery in this type is at once apparent, it may be said here as a corollary that it is advisable to precede the insufflation test in many cases by Hühner's test.

With the gonococcus as the dominating etiological factor in the production of the cervical infection, the tubes become involved through their migration along the uterine cavity and thence to the tubes. Depending upon the virulence of the infection, the degree of tubal involvement will vary from a simple catarrhal salpingitis to a severe pyosalpinx. As a rule the infection is mild and an endosalpingitis results. Tubal obstruction takes place from the agglutination of the opposing mucous membrane surfaces. The walls of the fallopian tubes are soon invaded, fine adhesions are thrown around the tubes, which bend, twist and kink them into various shapes and forms. These factors alone are sufficient to cause obstruction. In the main, the occlusion takes place at the fimbriæ and is brought about by the folding back of the fimbriæ on themselves back into the orifices of the tubes, thus becoming agglutinated through opposition of their various surfaces. An infundibulitis takes place, which destroys the mucosa on both surfaces of the fimbriæ, thus rendering possible their fusion and retraction, and under the influence of an atrophic influence the infundibulum is transformed into a cicatricial stump which is capped by adhesions.

With tubal deformity similar in character as far as the end results are concerned, the clinicopathological reactions engendered by streptococcal and staphylococcal infections vary from the above in several ways. With this type of infection, the lymphatics play an important rôle in its dissemination. The uterine lymph current can be traced from its

lacunar origin into the cervical and corporeal mucosa through minute funnel shapped ostia directly to the myometria. Here it branches into an extensive capillary net, and drains into two main collecting channels that course parallel to the uterine and ovarian bloodvessels at the base and top of the broad ligaments. The tubal musculature is likewise honeycombed with these lymphatics, and the infection from the cervix invading these lymph channels causes an ascending lymphangitis. The reaction is more pronounced in the tube, due not only to the thinness of its walls, but also to the fact that here the terminal lymph channels are located. The serous coat is soon invaded in the process, and a perisalpingoperitonitis, more commonly known as perisalpingitis, takes place. This is characterized by the formation of dense, firm bands of connective tissue that gradually distort the tube often out of all recognition. This alone is often sufficient to cause obstruction.

With the more virulent types of infection, small miliary abscesses may form in the terminating lymphatics of the tube, which rupture into its lumen with subsequent involvement of the endosalpinx. Usually the pathological picture present is that the fimbriæ are more or less preserved but are enveloped in a fibrous pocket without being involuted. Here the walls are formed by the organization of inflammatory exudates. The process of obliteration is simply due to an exudative periinfundibular peritonitis which becomes progressively organized. With a pathological picture present such as this, even when the cervical infection will permit the entrance of living spermatozoa into the fundus, it is reasonable to assume that no plastic operative measures upon such tubes should be undertaken until the etiological factors have been eliminated. As sterility plus tubal obstruction are only sequelæ, treatment should first be directed against the original disease, before any attempt is made to correct the resulting deformities.

It is unreasonable to assume that obstruction can be relieved and patency maintained by any form of surgery when the focus of infection remains with its known power of repeated reinfections both present and active. Under such conditions, surgical means to restore nonpatent lumens can only be temporary, leading to more severe closure, this in spite of postoperative insufflation.

Occasionally, a salpingostomy will be followed by a successful result. This occasional success can be accounted for by the fact that in some instances, the cervix after a time is able to rid itself of all microorganisms, leaving behind a hyperplasia of the mucous membrane. Examination in such cases reveals a slightly enlarged cervix, a thick mucoid discharge, but no bacteria present, in repeated smears or cultures. In such a cervix the power of reinfecting the tube is eliminated and an attempt at radical treatment may be tried. Such instances are, however, the exceptions.

Upon premises such as have been outlined above, the treatment of tubal obstruction should begin with a thorough survey of all the etiological factors concerned in its production. Where gross anatomical deformities are present, especially those relating to the fundus uteri, the point of attack should be in this direction. In the presence of adnexal inflammatory masses, conservative treatment should be the method employed, and a thorough removal of any etiological factor instituted at the proper time. Where examination fails to reveal fundal or adnexal conditions, possibly only a slight thickening, palpable in one or both fornices, the cervix will usually be found to be the seat of the infection, and early and thorough treatment is indicated to avoid the development of local barriers to the ingress of spermatozoa and to prevent the further internal extension of the infection. A careful study of the cervix should be made in all cases, and Hühner's test employed to determine the effect of the secretions upon the sperm. The prophylaxis of tubal obstruction will find its greatest usefulness in the early recognition and correction of cervical infection.

TREATMENT

It therefore becomes a matter of much importance as to what the proper and appropriate treatment should be. Local medicinal treatment of cervical infections, except in the mildest forms, is practically useless, since no local medicinal agent could possibly reach the deeper glandular structure. The application of radium in small doses may succeed in removing the diseased mucous membrane in a certain percentage of cases and can be tried. The method of choice however and the only one that will render the greatest number of successes is the surgical removal of the diseased mucous membrane. The ideal operation is the one that will remove the entire infected area without disturbing the anatomical and physiological relations of the parts involved. It should demand a complete enucleation of the entire infected endocervical mucosa, the preservation of its muscular structure, and the accurate relining of its denuded canal by an ample cylindrical flap from its vaginal sheath to obviate cicatricial contraction of its canal. An experience of many years with this form of tracheoplastic procedure, more than ever convinces me that it is ideal in accomplishing the desired result. With the removal of the infected area and the relining of the cervical canal with healthy vaginal mucosa, the danger of reinfection of both the cervix as well as of the tube is eliminaed. The lymphangitis gradually disappears, and the powerful regenerative faculties of the female genitalia manifest themselves in many cases by restoring such tubes back to normalcy.

A course of proper physiotherapeutic measures will aid very materially in the loosening of the old adhesions. Repeated insufflations should be employed as soon after operation as is consistent with safety, and at least one year allowed to pass before any further attempts at radical treatment be instituted.

SUMMARY

Summing up the subject, I would say that tubal obstruction is rarely a primary condition; that it is the result of an infection; that the focus of infection can be found in the cervix in the majority of cases; that this infection is chronic in character and consistently reinfects the tubes, and that proper treatment should demand the early and proper removal of this infectious area prior to any surgical attempt upon such obstructed fallopian tubes.

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Practical Therapeutics

THE BASIS AND DEVELOPMENT OF A SYSTEMATIC RESPIRATORY THERAPY

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The subject of the useful and the injurious effects of the individual parts of the respiratory act (inspiration, expiration, etc.), and their etiological significance in the occurrence of pathological changes were investigated. A systematic investigation of the thoracic organs of healthy and diseased persons was made possible with the aid of röntgen rays. This brought forth an entire series of new facts regarding the participation of the internal portions of the thoracic wall (diaphragm and mediastinum) in the act of respiration and made the direct visualization of the effect of the normal and pathologically changed respiratory act upon the viscera in part possible.

The significance of the respiratory act for the entire body has, accordingly, experienced a considerably changed point of view in recent years and it is therefore advisable at first to review briefly the form and effects of physiological respiration.

All the parts of the thoracic cage are almost never used uniformly in respiration. More often the quiet respiratory activity takes place more at the caudal and lower portion of the thoracic wall, except in the various types of breathing (costal, abdominal, costo-abdominal), whereas in deep respiration the cephalic and upper portions of the thoracic wall are utilized chiefly. The significance of the variations lies in the fact that the respiratory movement of a portion of the thoracic wall affects only the portions of the lung in its immediate vicinity, whereas the more distant parts are left entirely unaffected, because the variations in pressure in the pulmonary tissue produced by the movement are propagated only in a limited area.

In quiet breathing, therefore, the pulmonary apices, as well as the hilus portion of the pulmonary tissue are almost never aerated. Nevertheless, they are adjacent to portions of the chest wall, which do not undergo any motion at all. Their aeration is made possible only by deep diaphragmatic breathing, namely, through the movement of the tendinous centre of the diaphragm (Keith).

In the lateral posture, that half of the bony chest wall upon which the person lies moves very little, but the corresponding half of the diaphragm, on the other hand, moves much more than in the upright position of the thorax. In contrast to this, the bony half of the chest wall "above" the part on which the patient lies moves much more than in the upright position, and the corresponding half of the diaphragm only barely as much as it is moved along with the other side. The respiratory movements of the diaphragm resemble the movements of a pendulum hung from the "upper" chest wall.

In the next place, the "size of the lung" should be considered as the effect of respiratory motion, that is, the result of the continuous filling of the alveoli with air, which disappears after a long continued cessation of the respiratory activity (atalectasis formation); also of the pulmonary "tension" produced thereby, which constantly endeavors to return the lungs to the fetal condition of airless balance and thus constitutes a powerful expiration power. In addition, the respiratory movement denotes the physiological growth stimulus for all parts of the respiratory apparatus, and it also influences the position of the same to a marked degree. This influence appears particularly prominent in the case of the diaphragm; it is less distinct but, nevertheless, well demonstrable in the case of the bony chest wall. In addition, there is the intrathoracic power of suction produced by the pulmonary tension, which constitutes a considerable source of power for the returning blood circulation. The portion of the diaphragm pierced by the inferior vena cava also plays an important part, inasmuch as it regulates the uniformity of the blood supply to the heart, and at the same time is the most important factor in the expulsion of the bile from the liver. The action of the diaphragm in conjunction with the musculature of the abdominal wall produces the effect of a massage of the abdominal contents, and also of a support for the abdominal circulation as well as for peristalsis. Furthermore, the absorption of the fluid (lymph and exudate) present in the lungs and pleura is favored by the respiratory movements.

These observations lay the foundation for the results to be expected from respiratory disturbances, and closer observation results in a much larger field of results from a pathological respiratory technic.

Let us first consider the functional disturbances belonging in this group. A most harassing cough develops when, instead of breathing through the nose, the patient breathes for a long time through the mouth, even though the oral opening is very narrow, because the air, without sufficient moisture and warming by the nasal mucous membrane, injures the ciliated epithelium of the deeper air passages, and produces drying of the mucous. An especially harassing cough occurs in the early morning hours, because the oral opening is constant and much wider during sleep. Increased temperature (fever) results from the respiratory activity of diseased portions of the lung, in proportion to the resulting increased resorption of the toxins accumulated in the vicinity of the disease focus and of products of degeneration (bronchiectatic cavities, tuberculosis, pleural exudate). Dyspnea results from an improper respiratory function, inasmuch as in air hunger the inspiration alone is regularly exaggerated, but not so with expiration; therefore the amount of the stagnating residual air increases; the inspired fresh air is utilized only very poorly and the "healthy" portions of the lung are injured (vicarious emphysema in pleurisy, tuberculosis, etc.).

Exaggerated function is supplied chiefly by the bony chest wall, especially in the upper portions, where only the inspiratory muscles are attached; the diaphragm, however, which has a powerful antagonist in the musculature of the abdominal wall, often remains unaffected, so that it is drawn upward even

on inspiration (inspiratory depression of the gastric groove) and with it even the dilatation of the thoracic wall is in part paralyzed. The air aspirated into the upper portions of the lungs remains permanently in the thoracic cavity and embarrasses the penetration as well as the utilization of additional inspiratory air.

With a unilateral change of the respiratory function as, for example, that due to bronchial stenosis, a difference in pressure between the two halves of the thoracic wall develops with every respiratory act. The halves of the thoracic wall are separated from each other by the soft mediastinal wall, which is moved from its place by the difference in pressure, and there results the röntgenologically demonstrable displacement of the mediastinum.

The tendency to catarrhs in the upper air passages should be considered as the result of habitual mouth breathing, because the injury of the mucous membrane of the deeper air passages (mentioned above) resulting from the mouth breathing, as well as the deficient utilization of the uppermost air passages, must result in a reduction of the powers of resistance. The insufficiently prepared air due to mouth breathing produces an irritation of the nerves of the mucous membrane, and, as mentioned, an irritative cough. A pulmonary distention always results from air hunger and irritation of the pulmonary branches of the vagus and asthmatic attacks are even a result of this vagal irritation.

The predisposition toward pulmonary tuberculosis, which develops as a result of insufficient respiratory activity in the pulmonary tissue, constitutes the transition to the next group because it is often associated with an organic disturbance. Owing to the loss of the respiratory activity, that is, of the physiological growth stimulus, there results an insufficient development of the thoracic walls—the socalled phthisis habitus.

Before discussing this predisposition toward tuberculosis, however, we must at least briefly discuss a functional disturbance which is often encountered, namely, the impossibility of assuming a lateral position for a long time (clinophobia). This disturbance, which is often observed after pleural involvement, particularly after the healing of emphysema, and makes sleeping particularly difficult, may readily be relieved by respiratory therapy. It is caused by an agglutination of the diaphragm to the lateral chest wall, through which the necessary change in the position of the diaphragm becomes impossible. As a result of their weight, the abdominal viscera fall upon the abdominal surface of that half of the diaphragm which lies close to the side lain upon, push the diaphragm against the thoracic cavity there, and at the same time draw the "upper" half of the diaphragm as much as possible downward. If the diaphragm is firmly adherent in its lower half, this organ, drawn tightly like a drumhead, is stretched by the encroaching abdominal viscera. But if the upper half of the diaphragm is attached to the thoracic wall at the phrenicocostal sinus, the angle of the diaphragm cannot be opened and the abdominal viscera which pull from below produce pain there. The development of organic changes due to respiratory disturbances were also unmistakably demonstrated, especially by the frequent observation of unilateral deformities occurring after gunshot wounds of the chest. With insufficient respiratory activity of any portion of the lung there results diminution of the lung's power of expansion (atelectasis).

From a diagnostic as well as from a therapeutic point of view atelectasis of the apices and hilus, respectively, produced by such disturbances, has special significance. This change, considered as specific, often prematurely, occurs particularly after pleurisy and pneumonia, because after these diseases the diaphragm, which should be considered as the respiratory motor for these portions of the lung (Keith), is paralyzed much less; but it is also found in other conditions as the result of painful changes in the thoracic cage. If the breathing becomes painful, as the result of destruction of tissue of the thoracic wall, for example, the patient helps himself by diminishing the intensity of the movement of the thoracic wall as much as possible and forces a flattening of respiration through the use of the mouth as an air passage.

Functional diagnosis, that is, the differentiation with the aid of suitable respiratory gymnastics, alone makes possible the important determination of specific and nonspecific changes, and also the important prophylaxis of a specific infection of a previously uninfected, but markedly predisposed pulmonary apex after pleurisy and pneumonia, respectively, as a result of a function which is diminished because not sufficiently supplied with blood and air.

Upon this dependence of the air filling upon the functional size depends also the formation of shadows at the hilus with insufficient activity of the diaphragm. It is only the displacement of the heart in the vertical direction, which occurs with increased movement of the diaphragm in association with a change in form of the mediastinal wall, that supplies the renewal of air in those portions of the lung which surround the heart. Naturally, there are also associated with this, inflammatory changes of the tissue, as, for example, irritation of the bronchial mucosa, produced by a functional disturbance as well (mouth breathing mentioned above). With increased activity of the lungs, however, their air content is permanently increased and, consequently, there develops an enlargement (emphysema, increased pulmonary volume). In the same way the rapidity of the disappearance of pleural exudates depends upon the liveliness of the respiratory activity on the part of the portions of the thoracic wall surrounded by the fluid, and, accordingly, the permanency and induration of the same in the basal portions of the diaphragm (as a result of the continued low position and functional inhibition produced thereby), especially the portion lying between the base of the lung and the upper surface of the diaphragm. Even the externally visible changes of body formation, socalled pathological habitus, of the thoracic cage, and the formation of the face may be shown to be the result of a changed respiratory technic. Drop shoulders, flattening and protrusion, respectively, of the walls of the thoracic cage, as well as kyphosis and abnormal flatness, respectively, of the thoracic portion of the vertebral column and scoliosis of the same represent the sequelae of an increased or decreased activity, respectively, of the

respiratory musculature and also, especially, of the corresponding changes in their tone produced thereby.

The swelling of the legs as well as of the abdominal organs with deficiency of respiratory activity of the diaphragm and abdominal musculature constitute an additional organic change. These form such an important aid for the efferent circulation from the lower half of the body as to produce organic changes.

The displacement of the mediastinum with its consequent changes of form and stasis in the peripheral organs develops on the same principles, even though there is a difference in the tension in the two lungs. With a rightsided exudate there results a marked concave distortion of the venae cavae toward the right with marked kinking of the inferior vena cava at its perfornation of the diaphragm and indentation of the lumen of the superior vena cava in proportion to the displacement of the heart toward the left without simultaneous turning of the same. On the other hand, such a twisting does occur in the sense of a rotation around the site of exit of the large arteries, whereas the site of entry of the inferior vena cava turns from the left and posteriorly toward the right and anteriorly. The apex of the heart is turned anteriorly, which results in strangulation of the aorta and more often in strangulation of the pulmonary artery. In addition there is a sabrelike indentation of the latter previous to its division and further dorsally of the arch of the aorta, as well as a straightening of the cavae in the presence of a long existing exudate and induration formation (Gräff).

With continued mouth breathing the effect of the muscular tone of the lips is lost to the teeth and force is exerted by the pressure of the tongue acting from within: the teeth are pushed outward and become prominent. The lips and nose show the effects of a deficient lymph and blood return, which results from the deficient suction of the flattened mouth breathing and they become thick (scrofulous)—signs which usually give rise to the reverse conclusion, namely, that of malformation making the utilization of the physiological nasal air passage impossible.

As a result of the diminished activity of the diaphragm, which squeezes the liver by its contraction, like the hand squeezes a sponge (Wenckebach), there occurs enlargement of the liver as a sign of the stasis of blood, lymph and bile, as well as with persistent duration of the same, of a tendency to cholelithiasis (Naunyn). The stasis in all of the abdominal viscera resulting from the deficient respiratory activity of the diaphragm and the abdominal musculature, is easily understood in this way—motor gastrointestinal insufficiency.

On the other hand, the respiratory activity in lungs affected with tuberculosis produces emaciation in proportion to the absorption of toxic decomposition products favored thereby as an organic change.

These observations, based upon theory, allow the following conclusions to be drawn: The changing of the respiratory activity in the sense of a return to its form and intensity in the healthy person must produce a return or avoidance, respectively, of those disease symptoms which are produced by the change (increase or decrease) of the intensity, respectively, by the change in the respiratory form. *Cessante causa, sollitur effectus.* In such cases the change in respiration denotes etiologic therapy. The more pronounced use of respiratory movements for the purpose of a support for the insufficient powers, wherever the latter are not caused or produced by the respiratory activity (for example in the circulation) denotes a utilization of the respiratory powers in the sense of a compensatory therapy.

(*To be concluded*)

Action of Radiations on Tissues.—C. P. G. Wakeley (*British Journal of Surgery,* July, 1924) concludes from his experiments that as regards the mode of action of radiations upon living tissues, various views have from time to time been put forward, such as that the radiations decomposed the lecithin present in the tissue cells, and that its disintegration products acted in an ingenious manner. As a matter of fact this action upon lecithin has not been substantiated by subsequent research. Another view is that of specific activation of intracellular enzymes. Here, again, most recent investigations fail to demonstrate any such action, and experiments at King's College Hospital upon the oxidases, lactase and tyrosinase fail to show any effect as to sequel to irradiation. Probably no one theory can explain all the phenomena; but what does seem clearly established is that x rays and the gamma radiations from radium have a marked effect upon certain classes of colloids, among which are proteins and starch. Proteins undergo a marked diminution in viscosity, and are more easily precipitable after a radiation than before. In the case of starch, as shown by Colwell and Russ in 1912, this undergoes at any rate a partial change into soluble starch and dextrin. It seems not improbable that certainly one of the effects of radiation is disturbance of the colloidal equilibrium of the cells, with subsequent devitalization. If not carried too far the cell may recover, but if certain limits be exceeded the damage is irreparable, and the intracellular enzymes may then come into play, their action being of a destructive character upon the devitalized cell protoplasm.

Intravenous Injections with Blocked Reticuloendothelial System (Blockage Therapy).—Paul Saxl and Ferdinand Donath (*Wiener klinische Wochenschrift,* June 26, 1924) investigated the result of injections of colloidal silver on subsequent infusions of other substances. An intravenous injection of 10 c. c. of electrargol, which was administered ten minutes previous to an injection of water, dyestuffs, adrenalin, or of argochrome showed that the latter substances were retained in the blood for a longer period of time. In this way it is actually possible to accomplish a blockage of those organs, which otherwise retain all substances that are injected into the blood. Apparently this functional blockade shows at first only a specific character. Undoubtedly this established principle may have a great significance for intravenous therapy under certain conditions, as when it is desirable to keep injected substances in the blood for a long time, namely in blood infections in which the bacteria in the blood are to be attacked. The authors call this therapeutic procedure "blockage treatment."

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The Height and Duration of Fever in Relation to the Clinical Outcome in the Treatment of General Paresis With Malaria*

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General paresis, it needs scarcely be said, is a condition of the utmost gravity—the more so that in the great majority of cases it yields to arsenical treatment, if at all, only when that treatment is of the most intensive sort, including often of necessity the intracisternal and the intraventricular employment of the Swift-Ellis technic (1) in addition to its routine lumbar use. A new method of treatment of this disease, that of inoculating the patient with tertian malaria, as first practised by Wagner von Jauregg in 1917, has meanwhile entered the field and has seemingly justified itself in its ability to produce complete clinical remissions—*cito, tute, jucunde*—in some thirty-five per cent. of unselected cases of general paresis, according to the now rather extensive experience of workers abroad (2, 3) and to our own (4), and in a considerably higher proportion than this of early cases of the disease.

In combating a condition characterized by as ultimately hopeless a prognosis as is general paresis, it might be thought that to take into too serious account the dangers attendant upon the method of treatment employed bordered almost upon the irrelevant—"for extreme diseases, extreme methods of cure," in the Hippocratic aphorism; and it might, indeed, be held that even if treatment by inoculation with malaria were many times more radical and fraught with risk than would seem actually to be the case, it would still be a wholly justifiable procedure in the light of the fact that not infrequently it can achieve results which can otherwise ordinarily be attained only at the cost of infinitely greater trouble and consumption of time.

At the same time it would be absurd to maintain that infection with even a benign form of malaria differs from many another therapeutic method in being free from all risk whatever; and it is the purpose of this paper to point out in a tentative way the extent to which account should be taken of the fact that although a no more than transitory disturbance of the body economy seems, in the great majority of cases, to result from the pyrexia of almost unexampled height which infection with inoculation—malaria may produce, there remains nevertheless the occasional case in which contingencies ordinarily more or less remote must be kept in mind, such as the possibility of lighting up a quiescent tuberculous process, the possibility of producing severe hematuria, even the possibility—as yet open to considerable question, it must be admitted—of inducing a paretic convulsion (4), in addition to the occasional complications which have been encountered in the more extensive experience of certain European observers (5). Such possibilities, relatively remote though they may be in general, occasionally suggest themselves more forcibly than would ordinarily be the case; the personal responsibility assumed by the physician would obviously be rather greater than ordinary, for example, in the instance of an early, more or less nonpsychotic case of general paresis in which the desire to combine efficiency of therapeusis with economy of time might conceivably prompt the use of malaria treatment *ab initio*, with the postponement of the much more protracted arsenical therapy until afterwards. Finally, it is not without significance that—at least so far as our own experience is concerned—such few complicating features as we have so far encountered have made their appearance only after the seventh or eighth malarial paroxysm, or even later. It is on the ground of these several considerations that it has seemed to us possibly worth while to inquire as to the smallest "amount of malaria," so to speak—that is, in terms of both height and duration of pyrexia—which would produce, in the treatment of paresis, the results which have been seen to follow upon a more severe and protracted febrile reaction, and so to determine with some approximateness the minimal febrile response consistent with the assurance that the treatment has exerted its full beneficial effect.

The customary employment of nine to twelve febrile paroxysms in the majority of our patients before terminating the malarial infection with quinine

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has resulted in wide variations among these patients in their total febrile response as measured by the entire number of hours during which the temperature has remained above a given level, such as 104° F. or 105° F. In one patient, for example, who had eleven malarial paroxysms, the temperature remained above 104° F. for a total of ninety-two hours for the eleven paroxysms, whereas in another patient, inoculated with the same strain of plasmodium, and subjected to an equal number of attacks of malaria, the temperature remained above 104° F. for a total period of only thirty hours. It therefore seems reasonable to express the febrile response in terms of the number of hours during which a given height of temperature is maintained, rather than as the mere number of malarial paroxysms which the patient is allowed to have; and at the same time it appears natural to inquire whether a reaction such as that of the latter patient is not fully as therapeutically effective as the much more severe pyrexia undergone by the former, even though, as should be borne in mind, there exists no certainty that in the elevation of the body temperature lies the *modus operandi* of the malaria treatment of general paresis.

If we select from among the eighteen patients elsewhere described (4) who, following upon treatment with malaria, exhibited a remission complete enough to make possible their discharge from the hospital and subsequent return to work—if we select from among these the patients who showed relatively the smallest total febrile response, we find that two of them maintained a temperature of 105° or higher for a total of only five hours, another for six hours, another for seven hours, another for eleven hours, two each for fourteen hours, two for sixteen hours and three for seventeen hours all told. Six of these twelve, although reaching a temperature of 106° F. in one or more attacks, did not maintain this temperature for one full hour continuously in any one of them; while of the other six, three patients maintained such a temperature for a total of only one hour, one patient for two hours, and two patients for but three hours out of the entire course of their malarial treatment.

Hence it may be concluded, at least provisionally, that it is not necessary that a temperature of 106° be maintained for even as little as one full hour, since six patients who failed to do so nevertheless came to exhibit good remissions (excellent in three of these), and three additional patients achieved a similar clinical outcome after maintaining such a temperature for a single hour only out of the sixty to eighty hours in all during which their temperature was distinctly elevated; while even three hours as the total period during which the temperature remained at 106° or higher seems insignificant in comparison with the total periods of eleven, thirteen, fourteen and even seventeen hours (at 106° or over) registered by a number of patients in our series.

We can deduce with rather less certainty, however, the requirements in the case of a temperature of 105° F. Because two patients attained a singularly complete remission after a total of only five hours, throughout their entire course of malaria, during which the temperature was 105° or higher, and another obtained an entirely similar result on the basis of but seven hours altogether of pyrexia of this grade, it does not follow, of course, that intervals as brief as these would necessarily suffice in every case. But it is most probably of some significance that twelve patients (out of eighteen) managed to secure a good remission after a total of seventeen hours (or less) of a temperature of 105° or higher, and seven of these twelve after a total of fourteen hours or less.

It may be objected that these cases were of especially short duration at the time of treatment, and that accordingly a smaller amount of treatment was effective than would have been necessary had the cases been more advanced. To this it can only be replied that these twelve patients represented among them various stages in that degree of advancement beyond which it is for the most part impossible to obtain remissions at all; three of these twelve patients, for example, were as advanced at the time of their commitment and admission to the hospital as any in whom to date we have been able to obtain a good remission.

Nor are the results in question due solely to the clinical type of paresis which these patients represented; far from belonging without exception to the manic type which in our experience offers the best prognosis as regards the eventual occurrence of a remission, four of these twelve patients were of the expansive type and two were of the simple dementing type—in fact, the only two cases of this type in which we have so far obtained a good remission (4). Since, then, those factors which are in all probability of considerable importance in influencing the occurrence of a favorable clinical outcome were present in these twelve patients in an extremely variable degree, so that the group as a whole cannot be regarded as in any known respect unusually susceptible to therapeutic influence and therefore requiring treatment of less than ordinary intensity, it seems reasonable to infer that a temperature of 105° maintained for a total period of at most eighteen hours, and possibly of not more than twelve hours in all, will undoubtedly accomplish all that a more protracted period of fever of this height would do—an inference which is lent some further support of a certain kind by the fact that pyrexia of this degree maintained over total periods three times as long has not availed to bring about clinical improvement in a considerable number of other patients.

For the fact is not to be lost sight of that there are other factors than simply intensity of febrile reaction which determine whether or not a clinical remission is to be obtained in a case of general paresis treated with malaria—factors such as duration of the disease at the time of treatment and its clinical type, for example, and in all probability still others whose character is at present wholly obscure; so that it is only suggested in the present connection that a certain height and duration of pyrexia, which we estimate conservatively at 105° for a total period of not more than twelve to eighteen hours, will be as effective as an increased period of fever of this degree in attaining a favorable clinical result in such cases of general paresis as are still capable of a therapeutic response.

To say, however, that it is not necessary to produce or maintain a temperature of 105° at all would savor of defining the critical temperature above which remissions may be obtained in suitable cases.

but below which it is impossible to bring them about, and this we are far from being prepared to do. Since none of our cases has exhibited a temperature of 104° without at the same time (as has been seen) mantaining a temperature of 105° for at least five hours out of the total duration of the malarial pyrexia, we are not even able to estimate the total number of hours during which it is necessary that a temperature of 104° be maintained in order to produce a favorable result. We can only say that in four of our patients showing good remissions a temperature of 104° and higher was maintained for a total period of only nineteen hours but whether this period of fever of this degree would alone have sufficed, without the five or more hours during which, in addition, the temperature was sustained above 105°, we have no means of knowing. If the behavior of other strains of plasmodium should prove similar to that of the two which we have so far employed, this question, indeed, will scarcely arise; given the presumption that a temperature of 105° maintained over a total period of not less than twelve hours will accomplish all that may be effected by a more protracted period of fever, the only question of practical import will be whether five or six malarial paroxysms will not, if the plasmodium in use be sufficiently "virulent," fulfill this requirement, making unnecessary the nine to twelve febrile crises which have constituted the routine procedure in the past.

SUMMARY

1. Although the malarial treatment of general paresis cannot be regarded as a hazardous or particularly radical mode of therapy, cases at times occur in which it is desirable to know the minimum degree of febrile response, as regards both height and duration of pyrexia, which is consistent with the maximum therapeutic effect of which this method of treatment is capable.

2. Four of our cases of general paresis have achieved good remissions, two of these excellent remissions (all of them now of more than a year's duration), in whom a temperature of 105° was maintained for a total period of not more than five to seven hours, while in twelve such patients this total period did not exceed seventeen hours, being materially shorter than this in seven of these twelve cases.

3. Our data do not permit the statement that a total febrile reaction of much smaller intensity and duration than the foregoing would not serve as effectually in accomplishing the same clinical results; but in the meantime it seems safe to conclude that a temperature of 105° maintained over a total period of not more than twelve to eighteen hours will give rise to a favorable outcome, among unselected cases of general paresis, as readily (and with proportionately diminished risk to the patient) as an equal or greater degree of pyrexia maintained over a greater number of hours.

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The Treatment of Paresis by Malarial Infection*

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A hundred years ago paresis was a comparative rarity, but, of late, it is becoming so common, and the manifestations of the disease are so appalling, especially to the family and friends of the patient, that, in view of the gloomy prognostic picture painted by the authorities, any form of treatment which offers a prospect of ameliorating or controlling the condition is worthy of careful study.

No attempt will be made in this paper to discuss the etiology, pathology, symptoms or diagnosis of paresis, as these are well known to you all. We will briefly consider the prognosis and treatment, as outlined in the textbooks, as a background for what is to come, and then give a short résumé of the literature in English, upon the subject of one of the newest plans of treatment which seems to offer considerable promise.

This paper offers no new contribution to the literature of paresis, and is prepared solely for the reason that I, having facilities for reviewing the literature, have felt that a résumé might be of service to those whose time or library facilities are limited.

Starr (1) says that the prognosis in paresis is "absolutely bad," and recalls that Krafft-Ebing never saw a recovery in two thousand five hundred cases. As to treatment, he remarks: "No form of treatment will arrest paresis"; but suggests that the arsenicals, absolute abstention from business or excitement and symptomatic measures should be tried.

Jelliffe and White (2) call attention to the fact that remissions lasting for six months or more not infrequently occur, but that these are invariably followed by relapse and death.

Burr, in his translation of a two volume work by various noted German psychiatrists (1915, p. 711) states that this disease is "incurable and progressive," though remissions of some duration do occur.

In connection with the subject under discussion, it is of interest to note that the early work along this line was done in Europe, and that in this, the only

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German textbook consulted, there occurs the only reference found to the fact that, following acute febrile affections, the paretic may be surprisingly improved.

As to treatment, the authors offer nothing else which is new; antisyphilitic remedies, rest, confinement and symptomatic treatment being suggested.

Church and Peterson (3) declare that the authors have never known of a patient recovering, and that, in the twelve cases of recovery reported in the literature up to that time, it is their belief that the disease was wrongly diagnosd. Their recommendations as to treatment offer nothing in addition to what was suggested by the other authors quoted.

Against this gloomy background, we turn with a feeling of relief to the modern literature, where we find two methods of treatment under investigation which seem to hold out a measure of hope to the unfortunate sufferers from paresis. These methods consist in the administration of tryparsamide, and in infecting the patient with malaria, the latter of which will now be briefly considered.

In referring to the literature in German, the name of the author and the date will alone be cited, as bibliographies will be found connected with the articles in English.

The general idea of the nonspecific treatment of paresis was first announced by Wagner von Jauregg, so long ago as 1887, and he followed this up with other and later observations, which were repeated and confirmed by Pilcz in 1911.

In 1917, von Jauregg inoculated nine paretic patients with the blood of another patient suffering from tertian malaria, with results so far favorable, in the six cases which were not very far advanced, that, four years after the conclusion of treatment, three of the six patients were still actively at work.

In 1923, Kirschbaum reported a series of 196 cases, of whom sixty-one were classed as having complete remissions; while Gerstman, in 1922, reported 294 cases, of whom 112 were considered as having "good remissions."

A. R. Grant and J. D. Silverston (4) report the serological findings in forty cases treated by malaria, and in every case found some improvement. In 91.9 per cent. of the cases, the lymphocytes in the cerebrospinal fluid were diminished and in forty-nine per cent. the protein content became less; the blood Wassermann reaction was diminished in intensity in sixty-five per cent.; all three of these changes occurred in forty per cent. of the cases.

Warrington Yorke and J. W. S. Macfie (5) report results of inoculation of patients with tertian and quartan malarial parasites and also of controlled infections by bites of mosquitoes. These observers treated eighty-four cases of paresis by malarial infection, of which twenty-three showed such marked mental and physical improvement that they could be discharged from the mental hospitals; in ten there was definite physical improvement but no change in the mental condition; and in seventeen there was great physical and distinct mental improvement—a total of fifty patients improved.

Grant and Silverston (6) report fifty cases treated by this method since July 31, 1922, with tabulated data of the control of the malarial infection. Of these fifty patients, seven are reported as "completely recovered," having regained their full working power, while thirty-three have shown partial remissions.

Lewis, Hubbard and Dyar, of St. Elizabeth's Hospital, Washington, D. C., (7) have contributed an exhaustive and scholarly article, dealing with the history of the treatment of paresis; the history of the malarial infection treatment; and including numerous illuminating charts, graphs, tables and macroscopic and microscopic photographs. There is also a bibliography of sixty-seven references. These observers report fifty-one cases which were carried through a complete period of observation, of whom fifteen were reported, after exhaustive and critical study, as "complete remissions."

W. M. McGrath (8) reports a case in which the patient was completely relieved of the gastric crises of tabes by malarial infection.

Professor Wagner-Jauregg (9) reviews his earlier work and methods and reports a series of two hundred cases treated by this method, with fifty complete remissions, to the extent of permitting the patients to return to their former occupations.

In the same number of the same journal in which Dr. Wagner-Jauregg's paper appears, Dr. H. F. Delgado reports four cases, with complete remissions in two.

The most recent and easily available communication on this subject is by Bunker and Kirby (10). These authors review the literature, with a bibliography of twenty references (mostly in German) and add a report of fifty-three patients treated by this method, of whom seventeen have been discharged from the hospital as complete remissions; fourteen of these seventeen have returned to work.

The method of treatment given by these latter investigators consists in the inoculation of the patients by the intravenous injection of from one to 1.5 c. c. of typed, citrated blood from another patient, already under treatment, who is infected with tertian malaria. It has not been necessary to draw the blood from the donor during a paroxysm.

After an incubation period of from three to seven days, the patients begin to have typical malarial attacks, every other day or every day, and they are permitted to have from eight to twelve of these attacks, after which the malarial infection is controlled by giving ten grains of quinine, three times a day, for one week.

In eighty-two per cent. of these attacks the fever rose to 104° or higher; in sixty-nine per cent. to 105° or higher; and in forty-seven per cent. to 106° or higher.

The attacks of inoculation malaria proved to be more readily and promptly controllable by quinine than is usually the case with spontaneous attacks, resulting from the bites of mosquitoes. They find that there is no parallel between the clinical and serological results. Cases with the most definite and complete clinical remissions frequently show little or no change in the spinal fluid findings; while three cases where the spinal fluid became completely negative showed no clinical improvement whatever.

It is of interest to note that the clinical improvement of patients treated in this manner continues to progress for a number of months after the malarial infection has been controlled, so that results

reported less than one year after the cessation of treatment show less than the maximum improvement to be expected in a series of cases.

For those who read Spanish, two references not found in any of the other bibliographies studied are to be found in the articles of Merzbacher (10) and Sierra (11). The bibliography appended to this article is by no means complete for the literature in English, but cites only a few of the most readily accessible, representative and complete articles.

While no deaths have been found recorded which were directly and wholly attributable to this method of treatment, it is not at all improbable that a fatal outcome, in some cases, might have been more or less indirectly hastened by the severity of the malarial reactions.

SUMMARY AND COMMENT

1. Prior to the recognition of paresis as a syphilitic disease, the prognosis for recovery, or even for any reasonably complete or permanent improvement, was absolutely hopeless.

2. The recognition of the syphilitic nature of paresis and the advent of the modern methods of antiluetic treatment did not materially improve the gloomy character of the prognosis.

3. The method of treating paresis by infecting the patient with malaria rests, at present, on a wholly empirical basis, but present no great difficulty in its performance. The only basis for the results obtained seems to be connected with the hyperpyrexia produced by the malarial infection.

4. In the few articles here abstracted, there are reported 941 cases treated by this method, of whom 291, or 30.9 per cent., showed what were classified as complete remissions, most of these patients being able to return to their former occupations. The writer knows of no method for treatment of this disease showing comparable results.

5. The malarial infection may submit the patient to a possible danger of shortening his life, but, in a condition whose prognosis is so generally recognized as hopeless under older methods of treatment, it would seem that the possibilities for relief more than outweigh the not improbable chance that an already blighted life may be shortened.

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General Paresis and Its Treatment With Malaria

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It has been known for a long time that remissions of chronic disease may occur after attacks of an acute specific fever, or long continued suppurative processes. However, only recently has any really startling effect been wrought by the induction of acute fever in persons suffering from what has been regarded as an incurable disease.

Clinical cutaneous syphilis was recognized in Europe about the time of the return of Columbus (it is not definitely determined that the disease was carried to Europe by his sailors, however). The fact that syphilitics may later show nervous disease due to their general infection was not recognized until more recent times. The actual description of general paralysis with its intimate connection with mental deterioration was likewise unrevealed until not more than a century ago.

General or incomplete paralysis and disorder of the mind developing side by side and caused by chronic arachnitis (inflammation of the middle layer of the covering of the brain); in other words, that these two phenomena were the associated symptoms of a definite disease having a distinctive pathological anatomy was the contribution of A. J. Bayle. This opinion had never been previously expressed by anyone, and it has since been satisfactorily proved to be true in its essentials. Eminent neurologists have expressed themselves publicly as believing that the recognition of the association of the two orders of symptoms signalized the greatest advance ever made in the history of mental diseases.

The first suggestion of possible recognition of general paralysis of the insane is generally attributed to Willis in 1581.

The first case of undoubted general paresis recorded in medical literature was described in 1798 by John Haslam. He was apothecary to Bethlem Hospital, one time president of the Edinburgh Royal

Medical Society, and one of the original members of the Medicopsychological Association of Great Britain and Ireland.

Haslam's celebrated case was a man infected with syphilis while traveling abroad, and he had the typical delusions of grandeur. He considered himself at times the King of Denmark, and at other times the King of France. Ignorant, he professed himself master of all dead and living languages. The physical findings, the speech defects and the deterioration were noted.

Alcohol, venereal excesses, and anxieties were thought to be the cause of general paresis at this time. Clear cut descriptions after Haslam but without hint of the true etiology were given by Georget and Focelle, and Delage among others.

Bayle's contribution which has merited for him the designation of Bayle's disease as the eponym for general paresis, deserves further mention now. Bayle commenced the study of medicine in Paris in 1815, when he was only sixteen years of age. He early concluded that mental diseases depended for their elucidation on anatomical and pathological researches. He performed over four hundred postmortem examinations in less than five years. The thesis by which his work has come down to us is *Recherches sur les maladies mentales* submitted to the faculty of medicine at Paris in 1822. Bayle did much more work, wrote numerous monographs, and died in 1858. A recent publication was the *Centenaire de la Thesis de Bayle* (1822-1922) published in Paris. Bayle gave an accurate and almost complete account of the description of the pathological anatomy of general paresis. The inflammation of the meninges which he discovered he named chronic arachnitis.

No special advance in the study of paresis was made until Fournier on the basis of his exceptionally wide and long continued observations hit upon the mistaken theory of parasyphilitic diseases. Fournier gave the world the conception of diseases in which syphilis was the essential cause, but which were not the direct result of the syphilitic infective agent. General paralysis headed the list which was regarded as parasyphilitic. It must be borne in mind that Fournier did not have the advantage of the work of the bacteriologist, of the serologist, and the histopathologist who since Fournier has passed to the great beyond have given us the spirocheta pallida, the Wassermann test, and technic for the demonstration of spirochetes in the brain tissue. Although Esmarck and Jessen, and later Kuelberg were probably the first to call attention to the fact that general paralysis occurred especially in persons who suffered from syphilis, it was as a direct result of Fournier's work that Krafft-Ebing gave the famous dictum, "General paralysis is a product of syphilization and civilization."

It was then practically in our own time that the syphilitic causation of general paresis was proved. Only as recent as 1915, Nonne in his *Syphilis and Nervous System* devoted more than fifty pages to the consideration of the relation between syphilis and paresis. The Wassermann test opened a new field for speculation. Noguchi and Moore discovered spirochetes in the brain of persons dying of paresis, a finding confirmed by many; and Wile at Ann Arbor, and Forster in Germany, demonstrated spirochetes in the tissue taken from the brain of living paretics by puncture. Chemical, serological, and cytological formulæ have been elaborated which are almost infallible in the laboratory diagnosis of paresis by examination of the fluid withdrawn from the spinal canal.

The best treatment for general paralysis of the insane is preventive treatment. The modern dermatologists and syphilologists all are trained in the proper technic for the recognition clinically and serologically of symptoms indicating present or future brain and nerve involvement of the syphilitic patients under their care, before they become paretics.

The drugs used in the modern treatment of syphilis, namely salvarsan and its modifications; mercury in its various forms; and the iodides may in many cases complete a cure of the infection. In other patients, the brain is infested with the parasites and despite every therapeutic measure the symptoms of general paresis appear.

With the improvements in medicinal technic, and the utilization of Quinck's lumbar puncture procedure, we have within recent years attempted to reach the brain through the meninges and have introduced modified solutions of salvarsan by way of the spinal cord coverings. Enthusiasm for this form of therapy has not been sustained, and the syphilologist has welcomed another mode of attack on general paralysis.

As early as 1816, it was noted that cases of general paralysis frequently showed remissions of symptoms, and that often apparent cures were established following febrile illnesses. In an attempt to simulate the general reaction of febrile diseases, various substances have been injected into patients suffering from paresis. Chemical substances have been tried and discarded. Toxalbumins such as tuberculin have also had a trial. In 1917, Wagner-Jauregg inoculated nine patients suffering from general paralysis of the insane with blood withdrawn from a patient with benign tertian malaria. Six of the patients showed favorable results. This is about what happened. Two to four cubic c. c. of blood were withdrawn from the vein of the untreated malaria patient during a paroxysm, and immediately injected into the subcutaneous tissue of the buttock of the paretic. After a free period of from eight to twenty-eight days, the injected patient evidenced the chill and fever of a malaria infection. The patient was allowed to have eight to twelve chills, when malaria treatment in the form of quinine was administered. The quinine treatment of this artificial malaria is extremely effective, and no recurrence has been noted. Neosalvarsan or silver salvarsan may be administered intravenously during the period of quinine injection, but this has not been a regular feature of the treatment. The blood of the injected paretic shows the malaria parasite no different from those found in malaria acquired through the more natural channels, the mosquito bite.

Following the paroxysms of the febrile reaction to the malaria infections, the paretic shows a change for the better in no less than thirty-eight per cent. of the cases, and there is promise of much higher percentages of improvement, if not practical cures in the future.

It may be difficult in some communities to start the

malaria form of treatment because of the absence of malaria patients. Once obtained, however, the strain may be carried as long as patients are available to whom the blood of recently injected paretic malaria patients may be given. It has been found that the injection of syphilitic blood from one paretic to another has added nothing to the blood of the transferee.

I wish now to mention an observation which I have as yet not seen given in the literature on the malaria treatment of paresis. In the earlier days when clinical observation and tabulation of data were more carefully done than in our own hurried and laboratoried period, it was common to find the text books name certain regions of the globe apparently free from the nervous involvement of syphilis, although syphilitic infection was common enough in those same localities. The tropics have been noted for the absence of nerve involvement of syphilis. The reason may be but a natural malaria treatment, for as every one knows, the resident of the tropics rarely escapes malaria infection. Another possibility opens before us. Has transmutation been possible from the spirochete which causes frambesia, a disease of the tropics, simulating syphilis in many many respects but differing from syphilis in the absence of nervous complications, to the spirochete pallida of syphilis? Has the possible symbiosis or living together of the spirochete and the malaria plasmodium given us frambesia or yaws in the tropics? Has this same spirochete in the absence of the malaria plasmodium given the world syphilis? In this connection it should be remembered that the first observation of the disease which is regarded now to have been the one imported to Europe by Columbus's men was named to include the term *boubas;* a word used in the old Spanish records of tropical America to mean frambesia.

The remissions following the malaria treatment should of themselves not be regarded as anything especially new. Remissions in paretics are as old as the disease itself. In fact, in the first recorded case the patient was improved to such a degree that he was discharged from the detention home, only to return much deteriorated at a later date to die a paretic. The problem of remissions in paretics has been a difficult one. Has malaria given us an accidental remission? The observers, all enthusiasts, are certain that the remissions follow the malaria febrile disturbance of the entire organism, that the remissions are more marked, more certain, and actually last longer. Discharged paretics return, but the period of freedom has been longer. Some paretics have died paretics after the malaria form of treatment, and some have died of intercurrent infection apparently free of paretic symptoms. The histopathology of the brain substance of the treated cases of the later type has revealed the picture of the socalled stationary type of paresis described by Alzheimer. The blood and spinal fluid may continue to give the positive serological and chemical tests of paresis after the clinical improvement has been established. The physical findings may be markedly diminished.

The story then is that by artificial inoculation of malaria and the production of an infection of the blood cells leading to marked body reactions accompanied by paroxysms of fever, the symptoms of general paralysis of the insane are mitigated. The how of the treatment is yet unknown.

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Psychoneuroses in Relation to General Medicine*

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In order to understand the relation of psychoneurotic manifestations to clinical medicine in all its ramifications one must endeavor first of all to form a clear conception of the underlying factors capable of producing functional disturbances in the domain of the nervous system. Not infrequently it happens, as we all know, that when in a patient there develops for any reason at all subjective disturbances referable to the ear, nasopharynx or larynx, the otolaryngologist is consulted first. Should the subjective disturbances have an apparent relationship to the function of the ovaries, or to that of the vesical and biliary organs or of other abdominal viscera, to the function of respiratory and cardiac organs, to the function of the eyes—in all such cases the respective medical or surgical worker will be consulted first. Such an attitude on the part of the lay patient is psychologically logical and correct. But from a medical viewpoint, as we know, this attitude not infrequently leads to serious errors. That is to say, there are disturbances which have no fundamentally serious relationship to any given abdominal or thoracic viscera, but belong to purely mental functions which for reasons of a psychic character dissociated the work of various elements which enter in formation of harmonious display of organs and tissues. What precisely characterizes the patient in all such cases is not the multiplicity of symptoms, not the innumerable functional disorders which may simulate organic diseases, not the painful sensations which he or she experiences, but only a special state of mind, a special mentality.

Human machinery is so complex in its various operations that every one of us, otherwise sound, experiences now and then some indication of a functional disorder: either there is a gastric manifestation, or a vague pain, or a cardiac palpitation or a fugacious neuralgic discomfort. But being normally constituted, we give all such symptoms their proper interpretation, our attention is not firmly arrested on them, we continue our activities in spite of them. Furthermore, we are able to overcome unpleasant circumstances which may arise at any time, we may even surmount obstacles of a most serious nature.

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Our relative indifference to all such conditions constitutes a normal state of mental health.

On the other hand the persons whose attention is held firmly and for a prolonged period of time by those subjective disturbances enumerated above, who view the least unpleasant event as a catastrophe, in whom there develop obsessive ideas and hold on to them for months and years, whose association of ideas is such that fears, anxiety and abnormal inhibitive or abulic phenomena make their appearance with the greatest facility and ápropos of insignificant occurrences, whose suggestibility and autosuggestibility are exaggerated, whose reactions to external or internal stimuli are intense—all such personalities present a type a part, an abnormal type of humanity and therefore require special consideration.

Some fuller elaboration of this category of individuals is now indicated for a clearer understanding of the subject under discussion. First of all, psychoneuroses should be firmly distinguished from mental deficiency. The latter is usually congenital and inherent and is the direct result of a morphological or physiological abnormality of the nervous structure. Of course psychoneurotic manifestations may appear in mentally defective individuals, but there is no unusual relationship between the two and we are considering here only intellectually normal cases. Psychoneuroses are fundamentally psychogenic and develop in the midst and because of abnormal psychological experiences. Before discussing these experiences, let us present a few examples of psychoneurotic manifestations.

CASE I.—One female patient, aged twenty-eight, following a normal confinement with no undue loss of blood and with a prompt recovery, misinterpreted her slight serious vaginal discharges which she explained to herself as due to a serious affection of her genitalia. Otherwise perfectly sound she consulted a number of gynecologists, who treated her by various methods and two of whom performed curetting. The woman became much depressed, she felt very unhappy and was in constant fear of malignancy without an actual physical constitutional basis for it. Subsequent events proved that her belief was only psychogenic, as she made a complete recovery under a psychotherapeutic management.

CASE II.—A young married woman aged twenty-five, was suffering from chronic constipation. She would occasionally have headache. Coming frequently in contact with a female friend who also had headache and who attempted to commit suicide in a fit of jealousy of her husband, in my patient there developed an idea that her friend became insane because of the pain in the head, and that therefore her own headache might in the future lead to the same consequences. She was in constant fear of such a termination. She was advised to consult an oculist, who promptly refracted her eyes and told her that the proper glasses would cure the condition. For two years she was in a state of fear and anxiety without any relief. She consulted a gynecologist, also a general surgeon at different periods. The former curetted the uterus, the second operated for suspected adhesions of the transverse colon. Neither the glasses, not the curettement, nor the operation on the colon removed the original mental condition, although every one of the three men assured her that the removal of the condition which they considered respectively as the sole morbid cause would undoubtedly bring about a complete cure. Under psychotherapeutic measures during a short period of time the fear and anxiety as well as the slight headache have all disappeared.

CASE III.—A young man of twenty-five, during a period of three years complained of disturbances referable to almost every organ in his body. At first it was the heart, then the gallbladder, then the nasal cavities, the ears, the eyes, the genitalia, rectum, and finally the right hypochondrium. Numerous physicians in and outside of hospitals were consulted and everyone advised and actually performed some manipulations or small operations. Some of them advised gross abdominal operations. For the last of his multiple complaints a surgeon advised an appendectomy. Accordingly the patient was placed on the operating table. While the preliminary preparations were being made, namely the assortment of the instruments, washing the hands of those who were to participate in the operation, etc., the patient was suddenly seized with fright, refused to be operated on and at once left the hospital. Since then there has been no return of pain in the right hypochondrium. Towards the end of his peregrinations, he observed a slight cloudiness of his urine. At once he conceived the idea of a kidney affection. Again he consulted several internists each of whom made a different diagnosis. It is at that time that I had a good opportunity to see and keep him under observation. It must be mentioned at this juncture that during the entire illness of several years' duration the patient continued uninterruptedly his usual occupation namely that of a railroad conductor. He always slept well and had a voracious appetite.

At the time of the examination there was no doubt in my mind as to the psychogenic origin of all the complaints of the patient. Psychotherapeutic management alone succeeded in removing the last obsessive ideas. He is well at present, but since such disorders are episodic in character, the probabilities are that new hypochondriacal manifestations will eventually make their appearance when confronted with new emotional factors, the nature of which will be discussed below.

CASE IV.—In a girl of seventeen there developed abulic phenomena. If while crossing a street she would notice a loose brick on the ground, she would be seized with fear and a state of extreme anxiety if she could not and would not step over the object, but go around it and continue her gait. When, however she would make an effort to overcome her deficient will power, she would tremble, cry and stop. Being slender and pale and having irregular and scanty menstruation, she was taken first of all to a gynecologist whose diagnosis was anteversion of the uterus and that the latter was the direct cause of her psychoneurosis. He urged an operation. A general surgeon consulted subsequently spoke of uterine adhesions and advised some surgical procedures the nature of which I could not determine. A laparatomy was performed with the result of a decided intensification of her psychic condition as well as of her menstrual difficulties.

Examples, such as the few related, could be multiplied, but they are sufficient to demonstrate that

besides a physical there is also a psychological approach which after all may be the most important if not the only method in managing psychoneuroses. An organic or structural lesion can no more be viewed as the sole basis of functional psychic disorders. In order to know how to manage these peculiar phenomena, let us briefly consider their nature and their meaning.

The behavior of every individual is the result of an interrelation of several elements, namely, emotional instinctive tendencies, such as fear, anger, selfassertion, attachment, also the environmental conditions. The instinctive tendencies will have a different coloring in different persons according to inherited qualifications, that is to say a highly or less sensitive person will manifest his or her emotional elements in different ways. The constant interaction between these instinctive emotions and environmental objects or occurrences produces complex psychological states or complexes. We live therefore in the midst of daily or hourly conflicts between the inherent and exterior elements. Complexes are being created continually. When they are recognized by the individual self, the conscious ego is able to overcome them and the normal state is maintained and not disturbed. Many complexes, however, are not recognized, and since all complexes are different from each other and have a different aim and purpose, antagonism of one to another is constantly being created. As they are not recognized, as the conscious ego has no control over them, they may remain with us an indefinite time and are apt to create functional nervous disorders or psychoneuroses. In fixed ideas, obsessions, fears, states of anxiety, abulias, etc., in all such cases as we have seen from the histories of the few patients cited above, the physical symptoms alone emerge, such as pain in the hypochondrium simulating appendicitis, pain in the cardiac or pulmonary region simulating a disease of the heart or lung, etc., but the emotion associated with the fixed ideas remains, and as long as the latter is unaltered or not removed, the physical manifestation remains and the patient will continue being unhappy and a sufferer.

The various physical manifestations of psychoneuroses may be relieved and the individual may find with an effort on his part a certain skill in adapting himself to his environment and become more or less contented for the time being. But such a situation is not a cure, because the essential element in the conflict of various complexes has not been attacked, namely the emotional instinctive factor, which plays the most important rôle in the psychoneurosis.

It is not only the adaptation to the environment, but also and more emphatically the adaptation to oneself that is important. Otherwise speaking, a psychoneurosis can be removed only when the sufferer is shown how to unravel and lay bare the elements of the complexes which are in constant conflict so as to fit him to face himself. Attempts to remove physical discomfort will not remove the emotional elements which have created the psychic discomfort and which the patient will continue carrying with him indefinitely. The inability of understanding this essential principle and the want of desire to consider a psychological end in human suffering besides a purely biological end—are the cause of failure of treatment. Therein lies the reason of the fact that frequently the cause of psychoneurotic disorders is sought elsewhere: in the uterus, ovaries, in the genitalia in general. Next in order is the digestive apparatus that is not infrequently incriminated. Dilatation of the stomach, gastroptosis, enteroptosis, nephroptosis, cholecystitis—are all conditions that are thought of and major operations are often performed. Not only is there total therapeutic failure as far as the patient's complaints are concerned, but undesirable local and general consequences may arise which will render the operated individual organically unfit in addition to his psychic unhappiness. As one of many examples of this particular contention I may call attention to the damage produced by castration in women. In 1914 in a paper read before the American Medical Association (Vol. LXVIII, p. 1345) the medical histories of 112 women who underwent complete or partial removal of the uterus or ovaries or of both, were presented and were extensively discussd from the broadest viewpoints by internists, general surgeons, gynecologists and neurologists. It was shown that the preexisting nervous and psychic phenomena, for which the operations were undertaken, became aggravated in the weeks and the months following the operations. The obsessions and other psychoneuroses from which several women suffered prior to the oophorectomies became since then more persistent and covered a larger field of morbid ideas than heretofore. Those who suffered from the hysterical paroxysms began to have them in a more accentuated form and more frequently. Former hypochondriacal and anxiety states became deeper. All such cases were referred to the gynecologists with indiscriminate assurances that their vague nervous manifestations were exclusively due to indefinite gynecological conditions. Of course the operations were uniformly successful, but the victims' existences were rendered most unfortunate and distressing. It was evident that partial or complete hysterooophorectomies disturbed the well established physiological effect of ovarian tissue on the economy or perhaps disturbed the intimate relationship between various ductless glands, which as we have some reasons to believe, exists. At all events, in addition to the preexisting psychic phenomena additional disturbances were thus created.

The foregoing observations are sufficiently illustrative to contend that the real cause of psychoneurotic phenomena does not lie in accidental occurrences, such as traumatism, fatigue or local diseases. These factors react on us all daily, hourly, and do not produce disorders of a permanent nature. A psychoneurotic individual on the contrary reacts differently because of his special makeup, of his special mental characteristics. The latter render him highly suggestible, highly sensitive and highly emotional. While they do not present new phenomena which are not observed in normal individuals, their reactions, however, to all kind of stimuli are expressed in a greater intensity and are reproduced with a greater facility and branch out in a most unexpected manner. The complexes which were described above and which we considered as the result of conflicts between the instinctive emotional elements and the environmental occurrences are not easily recognized and they are not properly interpreted when recognized by

psychoneurotic personalities because of their peculiar characteristics. The complexes which arise in them are more numerous, more antagonistic to each other because of the greater intensity of each emotional element which enters into the formation of the complexes. The environmental factors which also form a part of the complexes equally give a different sensorial impression in the psychoneurotics and consequently the mental representation in the latter will be different from that of normal persons.

The methods employed in the management of psychoneuroses are several. The object of the present thesis is not the discussion of methods or procedures in bringing to the surface the modus operandi of the complexes which are the basis of psychoneurotic phenomena. My sole purpose is to call attention to the fact that all these abnormal manifestations are too psychic in character, that the functional disorders of which the victims complain are too much dependent upon special mental attitudes to be attributed exclusively to organic disorders of tissues and organs. Psychoneurotics are psychopathic individuals. They occupy a place between insane and normal. Their number is legion and their multiple manifestations present infinite varieties and subvarieties. The latter are intermingled and mixed with human suffering in all its forms and degrees, medical as well as surgical.

In dealing with human life it behooves us medical men to approach its phenomena not only from a purely biological but also from a psychological standpoint. The former has for object the adaptation of the individual to his environment. The latter is to have him adapted to himself. It is only after the latter task has been successfully accomplished the individual will be fit to face his environment. No removal of tissues or organs, no artificial correction of disturbances, however accurately or skillfully they may be done, will succeed in making a psychoneurotic discard his fixed ideas, his hypochondriasis, his abulias, his fears or his obsessions, if he or she is not taught properly how to restore peace amidst the bewildering complexes.

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Postoperative Neuroses*

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The term postoperative neuroses though a frequent clinical designation finds little discussion in medical literature. When case histories of this alleged illness are reviewed, one is impressed by the looseness with which this term is used. There seems to be no uniformity of opinion on what constitutes a postoperative neurosis. Consequently many types of psychoneuroses, if found subsequent to a surgical operation, are placed in this group. The validity of such diagnoses may be questioned for the existence of this diagnostic category is not yet established.

What suggests itself as a working basis is the limitation of the term to those neuroses which begin soon after the performance of an operation, and the subsequent illness should be not only superimposed but psychologically related to the operation. Then a careful study of the symptomatology may reveal either a difference from or similarity with the usual psychoneuroses, and the rôle of the operation evaluated as the provocative agent in the etiological moment.

A similar field of inquiry may be taken for comparison, i. e., the war neuroses. Here the direct causative factor of the war on the illness is not debatable. The mechanisms uncovered were not only those involving the object libido but also the ego libido. The significance of the trauma was chiefly in its element of surprise, in fright. In fact it is generally conceded that an injury or wound sustained at the time of the shock tended to prevent the occurrence of neurosis. Preoccupation with the traumatic incident is rare, and Freud regards it as significant that the traumatic incident is actively crowded out of consciousness; the sufferer strives to forget what has occurred. Only in dream life is the situation of the trauma lived over again. The dream continually takes the patient back to the occurrence of the disaster from which he awakens in renewed terror. This attitude of the traumatized sick individual is in contrast to the attitude which is usual in persons who have gone through a harassing experience but who have not shown any neurotic illness subsequently. The latter do not miss an opportunity to relate their experiences, and often exaggerate the importance of their own participation. In this regard they resemble the postoperative patient without neurosis who dramatizes all events relative to his operation, such as, the greatness of his surgeon, the duration of the operation and the miraculous performance.

Though superficially analogous, it becomes evident on closer examination that there is a marked difference in the circumstances and effects of the operation and the trauma. Though there is at the time of operation an element of fear, it is not that of fright. The element of surprise is lacking. A wound is always produced. The operation is recalled as having saved one's life, whereas the trauma is remembered as the near escape from death. The operation dream is an infrequent occurrence and is not one of anxiety. However, the behavior of the traumatized healthy person and the usual postoperative patient may have a greater significance than is ordinarily accorded to it. Certainly one does not find such dramatizations among patients in whom there have developed neuroses subsequent to operation. This continual reference to the operation and the praise of the surgeon would seem to serve an economic need in the distribution of the libido, by affording an outlet of organ libido which strives for a place

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of recognition in consciousness. It thereby prevents the damming of local libido of an organ, the erotogenic zone of which is stimulated by the surgical procedure.

The practical implication of these theoretical considerations is of great importance once we accept the psychoanalytical conception of the socalled functional psychoses (dementia precox, paranoia, manic depressive) as being due to narcisistic fixation.

That the psychoanalytical method may help in the elucidation of this problem seems plausible from the richness in results its application has produced in the entire domain of mental illness. The factors involved by Freud in explanation of the psychoneuroses have been amply corroborated, not only in the mental illness of peace time but as well in the neuroses of war. To be sure the external factors as brought about by war situations varied from peace time conditions in the causation of neuroses, but the essential feature that the illness was the result of unconscious mental conflicts has been demonstrated by MacCurdy, Brill, Jones, Ferenczi and others.

That the current factor, as in the instance of the war, may play the most important part in the immediate causation of the illness cannot be denied. Only in a few instances can the current factor be entirely eliminated as playing a part in the beginning of mental illness. Freud has pointed out that it is not the unconscious conflict alone which produces the illness. Environmental and current difficulties play no small part, though without the unconscious conflict no serious mental affections could be produced. Present day mental hygiene does not neglect the current conflict, though it attempts to attack the faulty unconscious adjustments. Until we are able to evolve the technic for a more rapid approach to the unconscious, all immediate promptings of a neurosis or a psychosis ought to be evaluated and if possible eliminated.

In this study twenty patients, in whom there had developed mental illness subsequent to operation, were carefully examined. Six cases representative of the group will be cited. The operations were performed on nonacute conditions. Among the operations on record were: tonsillectomy, nasal mucus resection, plastic surgery on nose, hemorrhoidectomy, appendectomy and cholecystectomy for chronic pain. In one instance which I will cite in greater detail, the operation was merely the removal of a wart from the thumb of the right hand. The mental illness which followed in each of these cases did not differ in type or course from the generally accepted classification of neuroses and psychoses. That the operation played a rôle in the constellation of the symptoms will be noticed from the following case abstracts.

Case I.—Male patient, twenty-eight years of age, complained of a queer gnawing sensation in the right thumb and hand since the excision of a wart on that hand, two years previously. He appeared anxious, could not be reassured, slept badly, and insisted that some vital nerve was damaged during the operation, or that a needle might have broken and worked its way to his brain and caused his marked nervousness. He realized the senselessness of some of his worries but complained that he was powerless when they possessed him. He soon had to limit his social contact and gave up his work as a mechanic, for he feared that in the presence of people he might have that queer sensation in the right hand which might embarrass him in some way, as in handling a tool, or putting on his coat or in eating. There were no abnormal involuntary movements nor any sign of disturbance in the motor or sensory fields, to warrant this fear of clumsiness. It was clearly a case of anxiety hysteria, and the current provocative agent was the slight operation. Without going into a detailed account of the analysis it was evident that the operation represented the realization of castration and the symptoms were the result of this unconscious phantasy. Of interest was the partial impotency which set in soon after the major symptom in the hand. The right hand was the guilty member in many masturbatory experiences and in assaults on a younger sister when he was six years old. When older he apparently overcame his sense of guilt and remained well until the time of the slight operation. Then the surgeon became the unconscious father against whom the neurosis was directed.

Case II.—Male, thirty years of age. He complained of a feeling of protrusion in the lower abdomen "as if something was coming out." He soon became inaccessible and developed into a typical case of dementia precox. The illness developed soon after an operation for inguinal hernia. Previous to the operation there was no evidence of schizophrenic symptoms. He subjected himself to operation simply because he did not care to wear a truss.

Case III.—Male, twenty-six years of age, Schizophrenic symptoms developed after an operation on a deviated septum. He was under the operation an hour and his first symptom was a feeling that his teeth were falling out. After three weeks this symptom was displaced by queer feelings in his hands. He felt as if his hands were detached from his body, and soon all his limbs were similarly involved. There was no evidence of organic neurological disease to account for his hypochondrical complaints, and soon there developed ideas of reference with the surgeon in the central theme. Again the interpretation points to the castration phantasy, involving the unconscious image of the father.

Case IV.—Male, twenty-four years of age. His operation was the correction of a deformity of the right hand due to an old fracture. While in the hospital he began to suffer from typical attacks of anxiety hysteria. He at first feared that he would never be able to use his arm, and this was followed by fears of falling, that he would urinate in public places and that he would lose control of his bowels. Analysis revealed the typical unconscious strivings as found in such cases, and the role of the operation in the initial production of the symptoms.

Cases V and VI.—Plastic surgery on the nose was responsible for producing psychoses in two patients who were brought to the Psychiatric Clinic of the New York Post-Graduate Hospital. In a girl of nineteen, soon after she had her nose deformity corrected, there developed delusions of reference relative to her new acquisition of beauty. Everyone was in love with her, every man was seeking her sexually, and she would spend hours before the mirror. She finally became uncontrollable and had to be committed to a sanitarium. The other patient was

a young man, twenty-seven years old, who soon after an operation for a crooked nose conceived the idea that his looks were forever marred by the surgeon who operated on him and who brought him to our clinic. He spent hours at the mirror, neglected his work became asocial and finally threatened violence to the surgeon whom he blamed for ruining his life. All these ideas developed in spite of the reassurance by his family and friends that the operation was successful. Months later he showed evidence of the same trend in milder form but had other symptoms of dementia precox.

That persons should seek plastic operations on the nose is in itself evidence of marked selflove (narcisism). The individual with narcisistic fixation is potentially in danger of a psychosis when his narcisism is injured.

It has been pointed out by Freud that mental illness may have its start in an auxiliary physical illness. In his patient, Lucy R., there developed hallucinations of smell with an accompanying depression while being afflicted with purulent rhinitis. Similarly, Ferenczi has called attention to the occurrence of a tic, which he regards as a narcisistic neurosis, on the site of local irritation. Other observers have pointed out the serious effects of orificial surgery when patients have presented schizophrenic symptoms after amputations of the clitoris, (Meagher). Actual injury to the penis has been known to produce the same syndrome. It is not unlikely that a trauma sustained by the symbolic representations of the sexual organs will provoke mental illness.

CONCLUSIONS

The psychoses or neuroses following operations are not clinically different from the known categories.

The operation may play a rôle as the provocative agent in that individual who is predisposed to mental illness by the castration complex or by narcisistic fixation. In such persons, surgical procedures, not absolutely necessary to save life, are to be avoided.

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The Psychiatric Clinic and the General Hospital*

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The recognition of insanity as a corollary of the baffling situation in social adaptation and organization is a twentieth century achievement. With this knowledge gained through the study of insanity has come the practical application of social problems. As the result of this new point of view there has developed a significant change in the relationship of the hospital for the insane to the community in general. The hospital is emerging from its previous isolation, pacifying those who are outside but narcotizing alike the physician and patient within its walls. It has extended its communications with the outside world through an increase in number and activity of its extramural consulting staff, through the elaboration of a social service system for the aid and supervision of paroled patients and through the inauguration of psychiatric clinics administered by the hospital staff in the larger cities of the territory served. The New York State Hospital system sponsors about sixty such clinics. These are held with varying frequency, sometimes in small towns. From the community, principally through social, educational, corrective and legal agencies, there has arisen an earnest attention to conditions resulting from conduct disorders bordering on insanity. These civic organizations appeal to the psychiatrist—to the hospital for the insane which is back of him—for enlightenment, guidance and paradoxically enough, inspiration.

In this convergence of attention on psychiatric investigation, so intrinsically an adjunct of medical progress, the general hospital and the general practitioner have remained indifferent and disinterested. In many instances the ignorance of the physician stands out in striking contrast to the more advanced conception of the intelligent layman in regard to the vast problem of mental disease.

Similarly the general hospital has failed to appreciate the significant power it has to render social service to the community in connection with mental disease. This has been due partially because of the inadequate instruction in psychiatry which up to recent times was offered in the curricula of the best medical schools. So the average physician's concept of insanity and insane people did not vary essentially from the prevalent conceptions of awe, loathing or hopeless pity entertained by the public. However, the community, the hospital for the insane and the general hospital itself have much to gain through the operation of psychiatric clinics as an integral part of the hospital scheme.

The greatest benefit from the arrangement undoubtedly accrues to the mental clinic, for in a large proportion of cases the psychiatrist will detect physical conditions which may have a bearing upon the psychical manifestations for which the patient is referred, notably cardiac and gastrointestinal disorders and visual and hearing defects. Moreover, clinical laboratory cooperation often forms a determining factor in establishing a diagnosis, especially where syphilis is suspected. The recently increased attention to the glands of internal secretion as possible influences in producing conduct disorders, has made the x ray laboratory and metabolic studies almost indispensable. The mental clinic located in the same building or adjacent to a general hospital dispensary enjoys the benefit of expert assistance from other specialties and an immediate rapport with the physicians making the tests.

The patient derives an immeasurable amount of assurance in a diminution of the stigma which still

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unfortunately cling like a pall about mental diseases, for when he visits a clinic located in the same building for other medical specialties he feels himself in no way distinguishable from others suffering from diseases conventionally accepted by society as an inevitable part of life's scheme. This seemingly slight circumstance tends to mitigate the feeling entertained by so many sensitive, mentally afflicted people that their trouble must be regarded as a disgrace to themselves or is so considered by their families. The latter is far too often true.

The social service worker, whose aid has become so extremely valuable in this field, finds that her delicate task of inducing psychopathic patients and their families to coöperate in treatment, is tremendously facilitated if she can refer the patient unconditionally to a general hospital which has gained the confidence and respect of the community, rather than an independently organized psychopathic hospital. The latter is so closely associated in the mind of the layman with the more violent and disagreeably spectacular forms of insanity, which are recorded daily in the press, that it is often regarded with suspicion, dread and repugnance. Social service workers who have had experience with both types of psychiatric clinics, that is, the independent and the affiliated, will corroborate this statement.

The objection raised that the presence of neurotic and psychotic patients in a general dispensary building would prove disturbing if not alarming to other patients has proved footless. Even with twenty-five patients in attendance, twenty per cent. of whom are considered psychotic, the dispensary attendants have found no greater difficulty in handling them than those visiting in any other department.

A plea is made occasionally for independently operated psychological or psychiatric clinics for the socalled socially maladjusted patients of the school age—the popularly termed problem cases, showing conduct delinquencies of various types. The advocates of these clinics assert—with some justification—that the social point of view is obscured in the handling of these cases by the restricting precision of scientific training of the modern doctor and the rigidity of hospital organization. However, I feel that both these disadvantages, and neither is irremediable, is more than counterbalanced by the contributions which scientific medicine can bring to bear upon the solution of perplexing mental problems. Often, as in the case of psychic symptoms dependent on a brain tumor, anatomical diagnosis is the only solution. On the other hand, the very presence in an outpatient department of a clinic where the social point of view should unswervingly predominate, reflexly, often remotely tends to alter the all too rigid and impersonal attitude of surgeons and even physicians. They sometimes regard their function to be exclusively the alleviation of an isolated pathological condition, quite apart from—possibly not even giving a thought to—the many-sided social attachments and aims existing in every human being, often affecting his reaction to and recovery from such a distinctly physical injury as a Pott's fracture.

Some years ago with the reorganization of the Neurological Department at Mt. Sinai Hospital, a clinic in mental health was established in the outpatient department, the chief of which was an adjunct neurologist in the hospital, thus bringing the work of mental hygiene into closer contact with the neurological division and the hospital in general. To my knowledge this is the first instance of the creation of a mental hygiene clinic in direct connection with a private general hospital in New York city. It was furthermore intended that patients requiring further tests or prolonged observation should be admitted to the neurological service of the hospital provided that their actions or conversation were not of such a nature as to disturb other patients.

The clinic is strictly a refer clinic, that is, no patient is admitted without an examination previously by physicians in other departments of the dispensary or outside physicians. Social service workers are welcome to bring their socalled problem cases directly to the clinic, but these patients sometimes have also had thorough physical examinations.

With a view to determining more accurately the type of persons using the clinic and the scope of the service which the clinic returns to the community, we reconsidered the first hundred consecutive cases[1] admitted in 1923.

The statistics concerning occupation, sex, race and religion afford little of general interest as they are dependent upon local conditions and the hour of the clinic. However, a few observations seem worthy of record. The first is that an eager daily attendance has demonstrated irrefutably the demand for psychiatric treatment by a group of patients who come voluntarily and present conditions requiring a specialized approach and subsequent handling. In many of them, especially adolescents, prophylactic measures appear to have been of considerable influence in forestalling more serious mental involvments, such as the progression to fully developed dementia precox states, and even the prevention of manic depressive attacks. A surprisingly large number of patients come not from the financially poorest strata of society but from the comfortably situated, by which term we mean persons connected with families, the combined income of which is sufficient to furnish food, clothing and housing of a quality necessary for health, without the assistance of charitable agencies. However, it is precisely in this type of family that the entire domestic equilibrium topples when mental disease seriously incapacitates or claims one of the productive members, whether it be a wage earner outside or the housewife upon whose domestic duties the home depends for its survival.

The sources through which the hundred cases were recruited, are divided almost equally between medical and social organizations, emphasizing the double function of the psychiatrical clinic previously mentioned. Over forty per cent. came for more specialized treatment from the various departments, both in and outpatient, of the hospital. Eight per cent. were sent directly by their private physicians. Organized social agencies were responsible for over forty per cent. and the value of our cooperation was apparently sufficiently great to induce one of these to engage a psychiatrist to handle its cases,

[1] I am deeply indebted for the assistance of Dr. D. D. Schonfeld and Miss Ida Segal, in making this study, which was undertaken primarily in order to furnish data for Dr. Frederick Brush of the Burke Foundation at White Plains, New York, where the establishment of a ward to provide for persons suffering from minor mental disorders is contemplated.

largely juvenile conduct disorders, at its own quarters. As none of the cases were referred by the courts or complicated by criminal charges, we were able to operate with greater latitude than where legal requirements must be considered.

The various hospital services increasingly seek psychological advice in regard to some of their physically afflicted patients, for the most part cases of conversion neuroses of gastrointestinal and cardiac types at times complicated by compensation considerations, and hyperthyroidism. Even the recalcitrant surgeons occasionally call for psychological investigations in connection with cases of abdominal pain or persistent vomiting to be sure more often after than before operation.

DIAGNOSIS OF ONE HUNDRED PSYCHIATRIC CASES

Outpatient Department

Psychoses		
Manic depressive insanity group	Simple depression	8
	Agitated depression	1
	Involutional melancholia	1
Dementia preecox group		7
Paranoid conditions		3
Paresis		1
		21
Neuroses		
Anxiety neurosis		14
Conversion hysteria		8
Neurasthenia		8
Compulsion neurosis		1
		31
Constitutional defects		
Psychopathic inferiority		16
Intellectual inferiority		9
		25
Not predominatingly psychopathic		
Conduct problem		7
Physical condition considered immediately responsible for symptoms		6
Epileptiform attacks		1
Endocrine disturbances		4
Normal		1
Convulsive tic		1
Undiagnosed		3
		23

In the diagnostic classification of cases, so much depends upon the training and point of view of the examining physician, that statistics do not convey an absolute indication of the nature of the cases handled. The gradual merging of neuroses into dementia precox on the one hand, and the depressions of the manic depressive group on the other, allows considerable latitude in the grouping. In general our tendency has been to classify these conditions as neuroses rather than psychoses. In diagnosis of the psychoses and constitutional defects (fifty-one per cent. of our cases) we have followed the concepts embodied in the nomenclature of the New York State Hospital Commission, and in the neuroses used the Freudian distinctions in our subgrouping, although nearly all socalled specific neuroses of Freud's classification include some of the features supposedly characteristic of one or another type. However, the term anxiety neurosis is used to indicate a situation where the outsanding factor is an unquestioned sexual abnormality still existent and operative in the life of the patient. Conversion hysteria indicates the unconscious symbolic expression of an emotional reaction by means of physical manifestations, such as the expression of disgust by vomiting or the desire for compensation by functional paralysis. Under neurasthenia are included those cases where the emotional disorder is accompanied by some evident toxemia, excessive masturbation or actual physical disease, which was held to be responsible for the fatigue and irritability. Compulsion neuroses indicate those cases where obsessive ideas alternate with uncontrollable doubt. Mental defectives, below the grade of constitutionally intellectual inferiors, did not apply for treatment probably because of the state provision for this group in New York.

The results of treatment in neurotic and psychotic patients is especially difficult to gauge and we should be wary of the word cure, which so often conveys little more than the whimsical personal conception of the physician reporting the case. We prefer to disregard the terms improved or cured in favor of emphasis upon the fact that the point of approach in all the functional cases has been an attempt to ascertain the subjective attitude of the patient toward his illness and problems, and to refrain from imposing upon him, as far as possible, the objective interpretation of the examining physician. At times when in the pressure of work we are compelled to assume the directing rôle, we are often in a position to advise (more pertinently and effectively, we believe) on the basis of analytic interpretations.

In a few cases of conversion hysteria and compulsion neurosis, a brief psychoanalysis, following the technic of Freud, and devoting over half an hour three times a week to the patient, has been undertaken with satisfactory results. However, as a rule we have not hesitated to use eclectically every means at our disposal indicated by clinical expediency in attempting to readjust the patient to his life's work and situations, namely, advice, persuasion, reeducation on the basis of psychoanalytical knowledge, special schools, visiting nurses to the home, recreation under the personal direction of the social service worker, rest in the country away from environmental annoyances and occupational therapy. The results, brilliant in some instances, are counterbalanced by discouraging developments in others. Approximately half of the patients attempted to cooperate to the fullest extent with the instructions of the physicians and social service workers.

The outpatient occupational therapy which is in charge of a paid worker with volunteer assistants, but housed in inadequate quarters, has proved a desirable adjunct to our reeducational and analytic procedures in the neuroses. In the psychoses, especially in the dementia precox cases and mild depressions, its primary value in arousing the interest of the patient hardly exceeds its secondary value of freeing the home for a number of hours each day from the care and burden of these patients. It has proved of some diagnostic value as a practical test, in that the manner of application to their tasks and attitude toward their coworkers, has revealed characteristics of the patients, sometimes not given a full valuation in the history or the oral examination. Many of the psychoneurotics find occupation a means of temporary distraction from their compulsive thinking and welcome the association with other persons inasmuch as their mental disability has frequently incapacitated them from initiating normal contacts in their own environment. It soon became evident that unless the patient regard the work seriously as an adjunct of his treatment, he would refuse

to cooperate, and that to the average dispensary patient, the presence of a doctor signified treatment. For that reason the moral support of frequent medical consultations with the therapist in charge in the presence of the patient, is indispensable. While the recreational and therapeutic aims are never slighted, we find it of advantage to pay the patients one third of the sale receipts of their work.

The activity of the clinic for three years has shown vast possibilities for extension of its scope which only the limitations of medically trained assistants and space has halted. These potentialities may be indicated in the testing of supposedly normal children, the psychological investigations of the emotional problems of the slightly deviating high school girl and boy, the behavior problems in the preschool age and the intensive superintendence of mildly psychotic patients residing at their own homes. Our experience has also emphasized the long felt need of a hospital or a ward for the temporary reception of borderline cases, who are not sufficiently ill to warrant even their voluntary residence at a state hospital, yet whose conduct is intolerable and misunderstood at home or whose environmental conditions are such as to greatly jeopardize the chances of recovery.

The Treatment of Peripheral Nerve Paralysis With Diathermy*

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Inasmuch as electrotherapeutics is not generally recognized as a factor in therapeutics, paralysis and electricity are in the minds of most physicians inseparable terms. From what I have seen, I might even say that this latter form of treatment is more often used by the profession than is justified in most cases. French and German authors have not been idle in setting forth various theories as to how and why electricity is the proper treatment for paralysis.

The fact that there are numerous theories points to the correctness of my teacher, Bergonie's frequent statement that little is known concerning its specific action. But even if we cannot as yet offer a generally accepted theory, it still remains an absolute fact that the irritability of muscles is greatly increased after the application of a constant current. This has been observed by Babinski. This increase of irritability can be definitely proved. A patient with a paralysis of the musculospiral nerve secondary to pressure will show, after the application of a constant galvanic current, an increased irritability of this nerve and the muscles supplied by it. The value of this observation has been greatly misunderstood. It is absolutely erroneous to expect a curative result upon a paralyzed nerve by means of electricity. Experiments made on rabbits and observations of cases of all types have led us to the following conclusion: We do not believe that the electric current has a specific curative influence upon the paralyzed nerve. We are neverthless convinced that the constant current greatly increases the irritability of muscles and that according to a more recent theory the interrupted current in both forms, galvanic and faradic, prevents an atrophy of nerves.

I have for a long time known these facts and, somewhat discouraged by the limited usefulness of electricity, some years ago tried to use diathermy in the treatment of nerve paralysis.

Diathermy is a high frequency current of high voltage and low amperage, which produces a resistant heat in the body without any electric sensation. It makes it possible as a result to administer heat upon deep organs and thereby produce hyperemia in any deep seated part of the body.

Some years ago a girl of twenty was referred to me with a contusion of the arm, with paralysis of the musculospiral nerve by trauma. I decided to treat this contusion with diathermy and strangely enough the paralysis subsided long before the ecchymosis, swelling, pain, and other features disappeared. I then treated a series of cases of nerve paralysis with a combination of diathermy followed by electric stimulation with the idea of hastening the process of nerve recovery by diathermy and also to take advantage of the influence of the interrupted current as pointed out before. The difference in the outcome of cases treated by this combined method compared with cases treated by electricity alone has been striking.

I unfortunately presented my ideas much too early to a small group of electrotherapeutists. The findings of most of them did not accord with my ideas. It was by accident that I discovered the error made by these physicians. One of the patients, with facial palsy, was severely burned by one of these experimenting physicians. In checking up this case I soon discovered that the limit of diathermy had been administered with the false conception that more heat meant more hyperemia.

The enormously sensitive mechanism of heat regulations of the body had not been considered by these physicians. It is well recognized, however, that the organism has a tendency to maintain an equal amount of heat all over the body within a certain physiological limit. It is evident that if a certain part is overheated, that this surplus amount of heat is carried away by means of the perspiration and the more rapid action of circulation from this particular part in order to equalize the body temperature. This action naturally renders the effect of diathermy also almost nil. Therefore, let me state quite definitely, that the maximum of diathermical effect does not necessarily mean the optimum of result.

In a long series of experiments on animals, I have carefully studied the effect of diathermy upon every type of tissue. Based on these findings I have postu-

*Read before the New York Neurological Society, February 3, 1925.
[1]Patient demonstrated before the New York Neurological Society in the Academy of Medicine, February 3, 1925.

lated the various methods in applying the current to different parts of the body.

In the course of this paper, I cannot go into all these details which are after all only technical questions of the treatment and likely to be of minor interest. I wish, however, to point out the fact that the results are absolutely dependent upon the correct application and thorough understanding of the indications. In the course of the last three years I have treated over one hundred cases of nerve paralysis, peripheral in origin, with excellent results.

Due to the fact that electrotherapy is still in its infancy, cases are mostly referred to us as a last resort and after all other forms of treatment usually have been attempted. And as a result, *ultimo ratio* an electrotherapist is given a rather unfair chance.

In September, 1924, a young gentleman was referred to me with the following history: Sixteen years ago a mastoid operation was performed on the patient. The facial nerve was injured in the course of the operation, which resulted in a complete peripheral facial paralysis of the left side. Electricity in all forms was tried in various institutions without any result and when the patient was examined at the Montefiore Hospital, the status was as follows:

"Face is drawn to the left side, no nasolabial folds visible on paralyzed side. By attempt to whistle or show teeth, typical picture of facial paralysis. Patient cannot close lid at all and the cornea shows signs of superficial inflammation due to exposure. Sensory of skin normal. Patient states that his face has been the same for the last sixteen years. The electrical reaction reveals partial reaction of degeneration of left facial nerve." Our impression of this case was typical facial palsy due to injury.

Diathermy was applied according to the usual routine. After five treatments patient reported that he felt as though his face was more pliable. After ten treatments the patient made the first attempt to close his eyes spontaneously.

Status made after twenty-four treatments shows: "Face appears equal on both sides. Nasolabial fold is distinct on both sides. Attempt to whistle. Showing teeth shows no abnormality. Patient closes eyelid spontaneously. The electrical reaction of facial nerve reveals no difference as compared to the other side of the face."

The question now arises what explanation can be offered for such results in the treatment of nerve paralysis with diathermy especially in the case presented. It is rather unusual for us to obtain results after sixteen years' duration. Possibly there was a scar left on the facial nerve of the patient due to the injury he received. By localizing the site of this scar we were able to concentrate the entire diathermy current on this very spot and propagated the absorption of scar tissue. The hyperemia set in the entire course of the facial nerve has undoubtedly helped the regeneration of the nerve fibres which have been atrophied by the years of disuse.

As you will notice, I am constantly referring to the effect of hyperemia caused by the diathermy current and you will undoubtedly ask why should not baking or other forms of treatment, which also produce hyperemia, be of the same value. The fact is that the hyperemia produced by diathermy is entirely different from hyperemia caused by other forms of treatment. Baking and similar methods primarily warm the skin or mucous membranes and attempt to penetrate the deep organ subject to treatment. The current of diathermy produces heat directly in the organ itself, no matter how deep seated it might be. Not only this penetrating effect of diathermy is what makes it so effective, but another important factor should be kept in mind. The warmth produced by diathermy is originated by a free energy which is introduced into the body by means of electricity. The warmth produced by the baking on the other hand is heat obtained by the energy of the organism itself and not as in the case of diathermy by an energy which is brought into the body. The principle of baking is to encourage the chemical interchange by increasing the local metabolism through the reaction set forth by the baking of the skin. In other words, the hyperemia of the organ to be treated is due to the biological reaction of the body upon the sensation of heat.

As you will see, there is a fundamental difference between the two methods. While diathermy brings a surplus of energy into the diseased tissues, baking and all other heretofore known forms of treatment cause an increased use of the body's own energy.

Diathermy Treatment of Paralysis from Epidemic Poliomyelitis.—Hugo Picard (*Monatsschrift für Kinderheilkunde,* June, 1924) states that the diathermy treatment of epidemic poliomyelitis if instituted immediately after the cessation of the febrile stage of the early part of the disease, resulted partly in complete cures and partly in marked improvement. Inasmuch as most of the symptoms of the paralysis are due to the pressure of the inflammatory edema upon the nervous muscle elements, a reduction of the edema and with it the cessation of the pressure is obtained through the diathermy. In addition, a destruction of the bacterial agent is brought about as a result of the high temperature induced. For localized paralyses (arm or leg) a transverse penetration of heat of the corresponding spinal segment and for complete paraplegias of both extremities the longitudinal, or possibly, a combined application is recommended. In addition, a peripheral diathermy treatment may be given to paralyzed extremities with marked hypothermia. The strength of the current for the transverse application should be 1.1 to 1.4 amperes and for the longitudinal application 0.9 to 1.1 amperes. Great care must be taken to avoid injuries. The duration of treatment is two months, daily at first and later every second day. Every application should last about fifteen minutes. Massage and active motion and the avoidance of deformities are also necessary.

Treatment of Epidemic Encephalitis.—Edwin Matthew (*Lancet,* June 7, 1924) obtained some very good results with the use of intramuscular injections of a twenty-five per cent. solution of magnesium sulphate in doses of four c. c., especially in cases of painful myoclonic contractions and marked choreoathetotic movements. The second dose is given twelve hours after the first, and the third and succeeding doses, if necessary, are given at intervals of twenty-four hours.

Historical Medicine

Modern Medical Ethics and Those of Plato

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In the *Charmides* when Socrates starts off with the idea that even a bad man may unwittingly do that which is good and as it naturally follows that a man unaware or unconcerned as to the result of evil may do either, the discussion takes the channel Socrates sets for it. Incidentally almost we pick up a whimsical remark of his that leads us into a labyrinth from which we do not always escape in medical ethics today. A man may not always be right in supposing it is of advantage to him to be cured of disease. Even the doctor is sometimes mistaken.

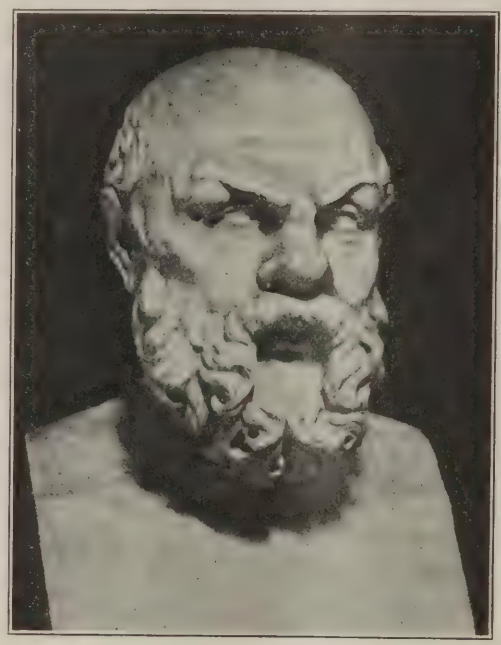
The question of right and wrong has very many facets. A doctor may be conferring by his ministrations at once a benefit on the patient, on the community, on the nation. On the other hand the interests of the individual and the group may clash. As practitioners we are apt to think our duty is primarily to our patient, but as health officers or army officers this is not always so plain. We may see the conflicting interests of both the man and the group or of neither. "A doctor may restore his patient to health without knowing whether it is good for him or not," Socrates says, and we see the complexities of ethics, before he gets through. Is health good for a man? What possibilities of shocking the medical profession with antitheses! Cure him of his wound and the sergeant will place the man on the firing line again where he certainly will be killed this time. Is that good for him? Who knows? Perhaps, but opinions may differ. The man himself might admit it was not good for him to be cured of his former wound. He would be pretty sure to think so. We all know what malingering is and the doctor's duty to his patient may well assume a dubious hue. He may need shelter even if not sick.

Is ethics something in the way of rules which is to make us mindful of the interests of the state or of the art of medicine? Does neither ever conflict with the interests of the patient? Again do we owe nothing to the spirit of Truth itself? to our own self respect? Ethics is indeed a thorny problem. Plato in the *Republic* approaches it in this way (No. 459): "When patients do not require medicines but have only to be put under a regimen the inferior sort of a practitioner is deemed to be good enough," the sanitarium director who, in Plato's understanding of the matter, follows the orders of the practitioners who are his patrons, if we may modernize the thought thus. It simplifies the matter greatly for both, for the practitioner and for the sanitarium director or for the specialist to have but *one* conflicting interest, financial, a splitting of fees. When, however, we put this behind us and consider alone the interest of the patient and the line of treatment we enter into the difficulties of practitioner and patient which Socrates faces. As to the regimen the house doctor does not have to lie and can be a quite inferior sort of person, "but when medicine has to be given then the doctor should be more of a man . . . a considerable dose of falsehood is necessary for the good" of the patient. As to the spirit of Truth itself, in the previous essay we have seen how deceit was to be used in furthering the interests of the state in the way of breeding citizens for the *Republic* and we may question perhaps the devotion of Plato to the application of the principle of abstract Truth. In this passage with which we are here concerned and in many others running immediately into the discourse of the dialogues we perceive how low intellectually Plato rated medical men. What business had they in the discussion of abstract ideas of the good and the true and the beautiful? They were affiliated with an order of thought which removed them from the higher ranks of intellectual life. They devoted their lives to the observations of the nature of man and its relation to the nature of the universe. How could they have any part in the realities of metaphysics continually immersed as they were in chimeras?

I am not here going to stray into a discussion of Plato's ideas as to the realities. It is not for me to say how much doctors lie to their patients. I have done a little of it in my day. They never do so so earnestly and foolishly as when they tell their fellow practitioners they never do. There seems to me there is no question the practice is a common one. Of course collated with and included in it as I use this ugly word is much else than the unequivocal lie. I use it to save time. I refer not so much to literal lying as to its cognate phenomena. How often it is necessary and how much it is necessary varies very largely no doubt, but it is this aspect of it especially which is such an evil for the practitioner himself. It is a bad habit. It degrades a man's inmost soul—no more in the form of a plump lie than in whipping the devil around the stump. The latter degrades a man's intellectual nature too. There is no such hopeless case intellectually as the man who is in the habit of lying to himself. Plato thinks it is not worth while, apparently, to bother about the doctor's spiritual nature. Plato was an aristocrat not only socially and politically, but intellectually, and he saw no reason why a physician, a lower caste man, should not sacrifice his moral nature on the altar of the patient's supposed welfare, even his peace of mind. I take it this is the shade of difference we must see between the ancient and the modern standard, whatever the practice may be. I am sure Plato would have put this argument in Socrates' mouth if he had thought it worth while to waste on a calling of inferior dignity the moral values he reserved for the higher evolved spheres in which his own intellectual and moral nature moved. The difference in the standpoint arises then apparently from a social evolution which allows a doctor the expensive luxury,

theoretically defensible, however rarely practised, of always telling the modern patient the truth.

There are many aspects to this question. I am not going to consider those which urge the valuable therapeutical effect of the hokus-pokus of the vulgar charlatan or his more subtle relative. It is continually intruding itself on our attention. But it troubles the conscience of the man of high respect for his own integrity to think he is violating the interests of the patient, which he has sworn to guard, by keeping his own selfrespect intact. There is a history back of our own ethical troubles, back even of Plato. Suspicion still lurks behind the practitioner of medicine. Primitive man made the life of the medical man a perilous one. In the courts of Augustus and Tiberius, in those of the Borgias and the other bad popes, in every place where wealth and power were sought and schemed for under the old dispensation, the physician and the poisoner have frequently been thought of as living under the same cloak. That belief, if not the literal fact, is what colors history for us with a murky atmosphere. There is free use of the medical art in the way of illustration in the dialogues of Plato, but the reference to the physician is always as to his skill, his knowledge or his ignorance. So far as I have observed there is no word as to his ethical problems. It was the advent of Christ which gave ethical value in itself to a life devoted to the assuaging of human suffering. That did not exist in Plato's day, but we get a hint of the primitive thought. It has stuck like a burr to us long after time was marked by the chronology of Christ's birth, much more than a thousand years after it. "He who can prevent or himself elude a disease is best able to create one."



Term of Socrates. Rome, Villa Albani.

Out of this old situation have grown many tendencies. Much more than from other men the modern public demands of the profession unimpeachable ethics. It has small concern with professional ethics. Honor, uprightness, charity, truthfulness, chastity, it demands of other men too, but it asks the medical man to work with might and main to diminish the need for his services, by rendering which he gets bread for his children. It asks that of no one else. It is a joke, it would seem, too preposterous to be true, but that is the truth of it. The modern doctor should be a State officer, drawing his salary from the State. This is no socialism. It is common sense. In this we touch the heart of the question. There lurks the old suspicion of primitive man in the form. "Am I to be made sick that this man may live, or made to believe I am sick?" Well, when a man lies to his patient and the patient's father to whom he has told the truth sees how smoothly he does it, or how like a snake he glides around the letter of the lie, what does one suppose he thinks? Thankfulness perhaps that the doctor has spared his son the pangs of fear and despair, possibly admiration of how he adds the mind cure to the drug cure, possibly his emotion blinds him for the moment to the doctor's lie, but if he is a man accustomed to judge and weigh men and accustomed to think well of them when the scales stand true at a high notch there comes the thought: "This man knows how to lie." The primitive man questions, "So this man knows how to poison, does he?" There in Plato we find it and since then, in the face of the most serious social and moral handicaps, the profession has won its way to a higher esteem, but there is no escaping the conviction that certain barriers, ethical as well as social and political, must be removed before it attains the highest possible.

In Plato's day the thought of poison was not infrequently to be reckoned with in the prejudice against doctors. Aristotle (Pol. III 16) remarks, "Whenever a sick person suspects his physician has been persuaded by his enemies to be guilty of any foul practise to him in his profession, he then chooses to apply himself rather to a book for his cure. The temptation to poison is no longer thought by our public to be constantly before us. Doubtless we are more particular to tell the truth than the profession in Plato's day. I don't think our code of ethics mentions the impropriety of poisoning our patients. No statute, however, could cover the subtleties of lying. It assumes too many forms. I presume if Plato had been a medical man with experience as a practitioner he would have made his Socrates go to the bottom of the ethics of medical men, but as a matter of fact he just says in effect—of course they lie, and lets it go at that. It has seemed in what has preceded that it behooves us to go deeper into the matter and consider it more closely. Even if we are convinced that under certain circumstances it is to the patient's advantage for us to lie by mind cure or what not, it is perfectly easy to give it a more euphonious denomination. We perceive we are on a slippery path and that apparent self-interest or vanity or something else personal to us, love perhaps, like Moliére's hero, is lurking in our rear and gently urging us on. To this enemy, and he may be legion, we can be sure even our public are much more attentive in observation than ourselves. It is hardly necessary to say more than that, since suspicion treads our path behind our backs, there can not be the slightest doubt that whatever may be the advantage to the patient or how often, our self-interest is eminently, not only to appear but, to be above suspicion. This, thank Heaven, is commonplace enough in our day, but it was not so at all in Plato's day.

In this book of Dupréel's (*La légende Socra-*

tique et les sources de Platon par Eugène Dupréel, Bruxelles, 1922) which has lured me again to Plato I have found little of this analysis which might have occupied the author's thoughts, but I have taken note of his giving credence to a saying of Diogenes Laertius leading up to the discussion as to making the worse appear the better part. Dupréel attributes to Satyrus, the first commentator on Aristotle, the remark that Empedocles not only was a physician but an excellent speaker and had Gorgias Leontinum as a pupil. Empedocles may have been a doctor too, but he was a great scientist, a great poet and a great fakir. We don't see that combination in such perfection today, but there are suggestions of it. He was par excellence the primitive medicine man and the modern scientist rolled up in one. In him the cave man greets us fraternally across the abyss of time. In the interest of his vanity or his safety, as Satyrus in a discussion of the ancient dialectics of the sophists intimates, he was master of the art of persuasion. In his time Empedocles had his fellow townsmen following him as though he were a god, as he said he was.

In the *Gorgias* (459 b.) the implication of the discussion at one time is that the physician ignorant in his art is frequently, by virtue of his art of persuasion, better able to influence the patient than the scientist. This is no secret, either ancient or modern, but it is interesting to see the thought of Socrates, that is without doubt here—of Plato, who well knew the Sicilian school of medicine, drifting back to Empedocles. The ethical aspect of this is further developed in the *Phaedrus* (261) where Gorgias, the Sicilian, is again to the fore in the mind of Plato and we are asked to believe that the more well versed one is with the varied aspects of the truth the better orator one may become. Under the scalpel of Socrates we see the doubting of this, doubt itself being an offspring of greater knowledge and a paralyzer of convincing oratory. The more eloquent rhetorician is he who knows just enough of his subject to believe implicitly in its dogmas.

In this connection we get here the mention of Hippocrates declaring that to understand man's body in a medical sense one must be acquainted with his soul. Which sentiment, while it occurs elsewhere in the Hippocratic Corpus, and which Galen ascribes to *The Nature of Man,* Littré thinks proves Hippocrates II was the author of *Ancient Medicine.* That may indeed be, but the more one reads Plato, the more one reads Hippocrates, the more one is convinced that much of the sententious wisdom which their books contain was current in the social body of Hellenic civilization of the time. We pick it out of Plato and Hippocrates when it falls in with the wisdom of our own time and because it is for the most part *their* books, only, survive. As a matter of fact such things are the wisdom of the ages. They are the A B C's of the wise man wherever and whenever he lives. Of course one talks best, orates most successfully about things in which one is most interested and the majority of intellectual men are interested only in things they partly comprehend. It is only the dullard loves to con over every hour a well known lesson. It is the social ass who is continually repeating it aloud. When Socrates and Hippocrates insist that the medical man must know other things than about man's body, if he expects to be a good physician, even they are but repeating the ordinary common sense of any civilized society. To use this as an argument that Plato was a plagiarist, in as much as Dupréel finds these sentiments in the *Dissoi Logoi,* which appears to have been notes taken by some student following Athenian lectures before or at the time of Plato's activity, is absurd. According to such a criterion Wells is the greatest of modern plagiarists.

Although in the *Nature of Man* and in *Ancient Medicine* there is no questioning the maxim that to speak properly of medicine we must know as much of the art as possible the author or, if there were two of them, the authors, insist that a knowledge of the bases of the other sciences lend persuasiveness to their discourse by exhibiting it. *The Airs Waters and Places* and *The Ancient Medicine,* in which this is so prominent a feature, are by far the most interesting books in the Hippocratic Corpus and, it happens, those which contain information still of good currency in the world of today. Now the teaching in the *Phaedrus* and in other books of Plato's, aside from the mocking irony of Socrates, is to the effect that to apply it specifically to our own interests, the knowledge of science outside of medicine must in the nature of things be more or less superficial. Yet the physician not only adds to his own storehouse of wisdom, but to the force of persuasion in his discourse. Pericles, Socrates insists, found it did when he spoke to the citizens of Athens on political subjects, resting on what he learned from Anaxagoras. The wonderful speech of Pericles, as given by Thycydides, implies this also. One may be sure Socrates laid open the subject so that one is reminded not alone that Pericles persuaded and ruled the Athenians, but for all that had not sufficient wisdom to bring up his sons properly. He makes us aware, too, of the pretence and ostentation that often goes with this sort of "persuasiveness." We still well know of such sons as those of Pericles. We still are well acquainted with the vanities of man. They are among the great human forces which move the universe.

Historical Note on Smallpox and Inoculation.—Dr. Charles Greene Cumston (*Annals of Medical History,* December, 1924) says that the practice of inoculation was introduced into America at Boston by Dr. Zabdiel Boylston in 1721 and later into Germany. Boyer's thesis upheld in 1717 at Montpellier is interesting because "it is the first French work in which reference to inoculation is made, and also because the thesis was published one year before Lady Montagu had her only son inoculated." No further attention was paid to inoculation in France until fourteen years later, when Marcot made a public address advocating it. But the first inoculation practised at Montpellier was performed by a physician at Nimes. The first inoculation was given on May 15, 1757, from a thread impregnated with virus which had been obtained from Geneva. Dr. Tronchin, who had inoculated the children of the Duke of Orleans that same year, was probably the donor of the virus. Dr. Cumston quotes from Gschwend of Switzerland to show that paralysis was often a sequel to smallpox in former days.

Contributors to the Science of Medicine

Thomas Linacre

Thomas Linacre was probably the greatest scholar who was also a doctor of medicine, not even excepting the great Sir Thomas Browne of immortal memory. It may be said of Dr. Linacre that in spite of the fact that he did much for medicine he was first of all a scholar, then a medicine man. Thomas Caius, also a physician and of immortal memory, did homage to Linacre in an epitaph on a stately monument surmounted by a phoenix in old St. Paul's, London.

It is now four hundred years since Linacre founded the Royal College of Physicians, London, and became its first president. Little is known of the early years of Linacre. Friend, in *A History of Physics,* Volume II, says that "Canterbury gave him his birth in 1460 and Oxford his education, he was chosen Fellow of All Souls." It must be understood that at the time Linacre went to Oxford that university was at a low ebb as far as learning was concerned. Wood describes the conditions as being in a very bad way and the Greek language being almost forgotten. It is the special glory of Linacre that he became the restorer of learning in England, that he revived the study of Greek and of the Greek medicine of Aristotle, Galen and Hippocrates. Linacre translated many of the works of Galen into English.

THOMAS LINACRE

When at Canterbury, he came under the care of William de Selling, a noted churchman of the time, who had already been in Italy, had studied Greek, and had brought back manuscripts to Canterbury. In 1488 Selling was sent by Henry VII on an embassy to the Pope and took Linacre to Italy with him and left him at Bologna which was then the seat of one of the celebrated universities of the world. He is next heard of at Florence at the court of Lorenzo de Medici named the Magnificent, where he associated with the master spirits of the age; indeed he may have sat at the same board with Michael Angelo. After staying in Florence for a year or longer he went on to Rome where he came under the influence of another great scholar, Hermolaus Barbarus. It was at about this time that he had access to the Greek manuscripts of Galen from which he made the translations published many years after. We next hear of Linacre at Venice, the friend and companion of the great scholar and printer Aldus. Linacre was one of the earliest of the English students to seek a medical education at Padua, then and for long after one of the most famous schools in Europe. On his way home from Padua he visited the renowned Nicolaus Leonicenus of Vicenza, one of the first and most distinguished of the medical humanists and author of the earliest treatise on syphilis then beginning to rage in Europe.

It is not accurately known how long Linacre stayed in Italy. When he returned to Oxford he resumed his teaching of Greek and probably practised medicine. Among those who studied Greek with him was Erasmus, who became his lifelong friend. Linacre, Grocyn and Latimer undertook the translation into Latin of the works of Aristotle, the father of physiology. In the meantime, Linacre's reputation as a scholar and also as a physician was increasing, but in or about the year 1500 his peaceful academic life was interrupted by a call to court to act as tutor to the son of the King, Prince Arthur. Soon after this he became the King's physician. At this period and for some years after there was a close relationship between the medical and clerical professions. It was no uncommon thing for a learned divine to practice physic and on the other hand a considerable number of distinguished physicians went into the church. Linacre joined the group and in 1509 and in succeeding years was given several valuable livings. From a statement made to his friend, the Archbishop of Canterbury, he seemed to have taken orders with a view to obtaining the necessary leisure for his literary work. He was still in practice, and with the organization of the Royal College of Physicians in London and his benefactions to the Universities of Oxford and Cambridge, his life was one of great activity. On October 20, 1524, he died from stone in the bladder.

As said before, Linacre was before all a scholar and played a great part in the revival of learning in England. But at the same time he has a very special claim on the medical profession as a medical humanist and as a leader of that band of fifteenth and sixteenth century scholars who sought to break the Arabian domination and to restore to medicine the teachings of Aristotle, Galen and Hippocrates. The revolt against the rule of Arabian medicine began and was fostered in the North Italian Universities. Not only were the works of Hippocrates

and Galen translated, edited, and published, but also those of Aristotle and Plato. The Greek ideals were brought back to medicine and observation and experiment were again made the chief aims of medical science.

As mentioned previously, Linacre translated and published many of Galen's works. In truth Linacre gained greater and more widespread fame as a grammarian than as a physician. His two works on grammar bore his name and fame into regions to which the name of the English physician had never penetrated. As Osler says in his fascinating sketch, Linacre may well be the old grammarian of the well known poem of Browning who doubtless got the idea from Erasmus. The following are two of the verses:

Back to the book then: deeper drooped his head;
Calculus racked him.
Leaden before, his eyes grew dross of lead;
Tussis attacked him.
"Now, master, take a little rest,—not he!"
Not a whit troubled,
Back to his studies fresher than at first,
Fierce as a dragon.
So with the throttling hands of Death at strife,
Ground he at grammar;
Still through the rattle, parts of speech were rife,
While he could stammer
He settled Hoti's business—let it be!
Properly based Oun
Gave us the doctrnie of the enclitic De,
Dead from the waist down.

Linacre was well acquainted with the North Italian Universities, the most flourishing of his day, Padua, from which he graduated, Bologna, Ferrard and Pavia. He knew their medical schools, some of them in towns smaller than Oxford and Cambridge, to which went students from all parts of Europe. At both Pavia and Padua in 1467 there were thirty-five well paid teachers in the medical faculties. Linacre endeavored to organize medical faculties at Oxford and Cambridge after the manner of the North Italian Universities and with this end in view made provision for two lectureships at Oxford and one at Cambridge.

However, Linacre's name is indissolubly associated with a more important foundation by far, the College of Physicians of London of which he was one of the founders and the first president in the year 1518. Somewhat curious to relate and a fitting commentary upon the conditions prevailing as regards medicine and surgery, the license to practice medicine was in the hands of the church. There were a few physicians who were often churchmen, a few surgeons, but the bulk of medical practice was done by barber surgeons and apothecaries. The original charter of the College of Physicians of London allowed it to regulate the practice of physic in London and for seven miles around. Four years later the privileges of the college were extended over the whole of England. Only graduates of Oxford and Cambridge were allowed to practice without a license and it was many years before the bishops gave up their rights. A remnant of this ecclesiastical privilege still persists. The Archbishop of Canterbury has the power to confer a doctorate of medicine, known as the Lambeth degree.

Among the Linacre lecturers at Cambridge sixteen have reached the distinction of the Dictionary of National Biography. Among these the most interesting names are William Heberden and Thomas Watson. Heberden, known as the English Celsus, was Linacre lecturer from 1734 to 1738 and his commentaries, although written in Latin, remain an English classic. Thomas Watson, the lecturer for 1822-26, was one of the cultured physicians of the nineteenth century, whose textbook, a model of literary style, still holds its own on account of its admirable clinical description of disease.

Thomas Linacre will live as a mighty Greek scholar and grammarian and as one who did most to restore the Greek spirit of medicine to the English medical profession.

The Ceraunia or Thunder Axe; Its Use in Folk Medicine.—Dr. M. A. van Andel, of Gorinchem, Netherlands, writes (*Annals of Medical History*, December, 1924) that not only in the countries of Europe, but also in many Asiatic countries, such as India, Burma, the East Indian Archipelago, China and Japan, and also in Africa and Brazil, do many of the present inhabitants believe the arrow heads, flint axes and mallets unearthed from prehistoric mounds or turned up by the plough to be "thunder axes" created by flashes of lightning penetrating the ground where the objects were found. Such a ceraunia or thunder axe, they believe, will rise to the surface in from seven days to seven months or seven years, and will protect any one who finds it from lightning, evil and disease, and give him the magical powers of being able to fertilize fruit trees, protect babies from witches, and promote a prompt delivery. To the Germans, these objects were the hammer of Thor. In Japan flint arrowheads were thought to have rained from Heaven, or been dropped by flying spirits. Pliny described them and their protective and curative uses, and ascribed their origin to a flash of lightning. Boetius is sceptical and inclined to think these objects might be stone tools very much like iron ones in use in his day, were it not for the fact that trustworthy witnesses have assured him that they found such stones in trees or houses recently struck by lightning. Therefore he deduces the hypothesis that such stones are formed by terrestrial exhalations which are condensed in the atmosphere and flung back to the earth when the cloud containing them bursts during a thunderstorm.

The Dutch naturalist, Ramphius, says the natives and Chinese dwellers of an island of the East Indian Archipelago think that these prehistoric remains are the teeth of a great bull who roars in the heavens and spits out his teeth which fall to the earth. Rumphius, however, does not admit this superstition, but concocts a theory somewhat like that of Boetius, explaining the peculiar shape by astral influence. The stones were used in the island as amulets to procure invulnerability, and to cure feverish diseases caused by a wetting from a thunderstorm. He tells us that in the Low Countries such stones are used as medicine. Herdsmen try to cure sick cattle by having them drink the water in which such a stone has been laid, and women with ulcerated breasts rub them with these stones to alleviate the inflammation.

In Saxony these relics were thought to protect their owners from nightmare.

Editorial Articles

MEDICAL PROGRESS IN 1924

A brief survey of the medical and scientific literature of the year 1924 will show the most significant and practical advance in medical science to be the greatly increased scope and content of public health work. New York, both city and state, has taken definite steps in this direction, the former in its intensive health demonstration in the Bellevue-Yorkville district; the latter, among other ways, in its inauguration of the demonstrations in Syracuse and Cattaraugus County. The United States Public Health Service has made a number of intensive studies and investigations, some of which are still in progress. The most notable of these are, perhaps, the survey of the health departments of one hundred cities of seventy thousand population and over; a study of common colds, especially in their relation to industry; and an investigation of conditions in industries presenting large occupational hazards. Allied to this last problem has been the awakening of interest in the prevention of carbon monoxide poisoning, especially as an industrial hazard, and also as related to the use of gas heaters in living quarters. Another important contribution to public health has been the surveys of the American Child Health Association in nearly one hundred cities of the United States. Accidents from automobiles have increased so greatly in number that a conference on motor vehicle traffic was held last spring in New Haven, the proceedings of which were published by the Yale University Press. The use of iodine as a preventive of goitre, a serious health problem in the Great Lakes region, has been studied and experimented with as a step toward establishing a definite program of treatment.

Probably the most important event in scientific medicine of 1924 was the isolation of the streptococcus as the definite causative agent of scarlet fever, the discovery that this organism produces a soluble toxin, that almost certain prevention is possible through the use of an antitoxin, and that immunity can be demonstrated by a cutaneous test. A large part of the above investigations were carried on by Dr. George F. and Dr. Gladys H. Dick, of the McCormick Institute for Infectious Diseases, Chicago. Other discoveries of the greatest significance but too well known to the medical profession to need more than the briefest mention are those of Dr. Moellgard of Copenhagen and Calmette of Paris in regard to tuberculosis, who are experimenting along lines of both prevention and cure. The theory of the cure and treatment of rickets by sunlight has received significant confirmation through a number of different studies and experiments carried on in various localities.

Other activities of perhaps secondary importance have been a survey made as follows: a study by the Department of Agriculture of the ripe olive problem as a menace to public health; the mosquito control work in the Canal Zone, which has resulted in rendering that region practically mosquito free; and successful activities toward the sanitation of bathing places and summer camps. Steps in public health education have been taken toward the prevention and care of the increasing number of cases of heart disease, cancer and diabetes. A number of the larger cities of the United States have launched projects along health lines, as for instance the child guidance clinics of Minneapolis, St. Louis, and Dallas. Boston opened on November 1st a new health unit, in the North End, and Columbia and Johns Hopkins Universities have both added to their facilities for teaching and research in psychiatry. Columbia University and the Presbyterian Hospital had made good by the end of the year in their campaign for funds for the new medical centre now in course of construction at Broadway and 168th Street, Manhattan.

It is both profitable and encouraging to review such steps as the above, and realize that the fact that they are taken means that the gap between the theory and practice of medicine is gradually closing, and that in the not far future doubtless much of the waste and duplicated effort in public health activities may be eliminated.

ENCEPHALITIS LETHARGICA

Sleeping sickness, socalled, an obvious misnomer as it is apt to be confused with the genuine sleeping sickness, is the most mysterious disease which has come into the limelight in recent years. Its origin is almost as obscure as when Economo and von Wiesner first called attention to the disease as an independent one, no longer ago than 1907. Since that time so much interest has been taken in the subject that its literature is now portentous in extent. Epidemics and sporadic cases of the malady are appearing continually in various parts of the world and naturally those engaged in medical research are agog to discover the cause. A short time ago the British Ministry of Health published a memorandum on encephalitis lethargica, in which the main and most salient facts relating to the disease are set down fully. It is pointed out that it was at first thought to be a form of botulism, and then as the cerebral form of

acute poliomyelitis, but detailed, clinical, epidemiological and pathological investigation has resulted not only in its identification with the clinical forms described previously in Vienna, but also in the elucidation of encephalitis lethargica as a distinct disease.

Of course, encephalitis lethargica has been put down as a form or type of influenza, and in spite of the weight of evidence which goes to show that it is an independent disease, there is yet much in favor of the former theory. Dr. Smith Ely Jelliffe, writing on the nervous syndromes of influenza in Crookshank's *Influenza* published in 1922, has a great deal to say concerning lethargic encephalitis. He points out that this type of disorder has been reported as occurring all over the world since the beginning of the 1915 epidemic of influenza. Whether, however, the influenza bacillus, if there is any one bacillus causing influenza, is able to cause a type of lethargic meningoencephalitis which Jelliffe describes, is still to be proved, as he himself admits. Moreover, he draws attention to the fact that the cases hitherto reported have all the features of an acute infectious disease, and he also draws attention to the fact that in the epidemic of 1889-91, such case reports began to appear in the literature. Henry Young called it grippe catalepsy, and Louguet, in 1892, referred to many of the cases as attributed at the time to influenza.

Strauss and his colleagues believe that they have isolated a specific filtrable virus; others have reported negative findings. Jelliffe thinks that it seems to be indicated that a definite polymorphism is present which points to the fact that there may be several agents, among which the influenza organisms are among the more prominent, capable of producing grave mesencephalitic lesions.

It is true that a virus has been obtained from the nervous tissue and nasopharyngeal mucosa of those suffering from the disease and a virus having similar properties has been obtained from the mouth of a healthy contact: these bear a close resemblance to the virus or herpes febrilis. But much further experimental work is needed ere any definite statement can be made.

It has been pointed out that minute bodies have been found in the tissues, the exact significance of which remains to be seen. It really seems from several aspects that it is almost as likely to be an outcome of influenza as an independent disease. But the cause or causes of influenza are not decided, seeing that the Pfeiffer bacillus has fallen into disrepute as the cause. The main features of encephalitis are that it attacks the central nervous system, producing lethargic, frequently almost cataleptic symptoms, that its mortality is high, that it journeys through the world in a slow march of epidemic character, leaving in the wake of its acute stages, serious, often disastrous aftereffects, and lastly, that no reliable therapeusis for the disease itself or for its sequelæ are known. Both from the bacteriological and clinical points of view the deadly disease of obscure origin and calamitous aftereffects require much further study and close investigation.

NEW LIGHT ON HUMAN DEVELOPMENT

A matter of two years or so ago, the scientific world was stirred by the announcement of the discovery of the Rhodesian skull, a relic of primitive man of the Neanderthal type which lived in Europe in Paleolithic times, maybe between thirty or forty thousand years ago. Recently, a discovery of a more sensational character has been made in South Africa. Professor Raymond Dart, of the Witwatersrand University, Johannesburg, states that he has discovered a fossil ape man, unlike any existing anthropoid, and more nearly resembling man, than the fossil remains of any ape yet discovered.

Professor Dart is now engaged in writing a monograph on the subject and pending the publication of this, final judgment must be reserved, but a sufficient account has been written by the discoverer in *Nature*, February 7, 1925, to justify the conclusion that the discovery will constitute one of the most important contributions to the solving of the problem of man's origin and evolution that up to the present time has been made. The skull was found in a limestone quarry eighty miles north of Kimberley on the eastern frontier of Bechuanaland. It may be recalled that the skull of the famous Rhodesian man was found deep in the bowels of a limestone hill. Australopithecus Africanus, the name given to Professor Dart's manlike ape, is said to approximate to man more closely in those important characters which are regarded by anthropologists as significant, than any fossil remains of a similar nature as yet found.

According to the description in *Nature* the cranium as a whole is distinctly humanoid in character. This is particularly apparent in the harmonious relation of the length of skull from front to back and the length of face, which in all apes are disproportionate to one another, and also in the slope of the forehead, which does not recede in the same degree as in the ape. The prominent eyebrow ridges with their lateral expansion, characteristic both of ape and the Neanderthal man, are entirely absent. The lower part of the face does not project nor does the chin recede as in the chimpanzee and gorilla, or even as much as in the Piltdown skull. The whole form of the jawbone is significant for,

while it is heavier than that of man, it is distinctly lighter than that of the anthropoids. The teeth are humanoid in character but immature as the specimen was young.

As Sir Arthur Keith has pointed out the size of the brain becomes the anatomist's criterion of humanity. The human brain varies in size; it may go up to 1,900 c.c., it may fall as low as 950 c.c. We do not expect beings who fall below the minimum of the scale to be capable of reasonable conduct. Among chimpanzees the brain varies in size from 320 c.c. to 490 c.c., among gorillas, from 370 c.c. to 620 c.c.

Thus between the highest anthropoid ape and the lowest living human being there is a wide gap. This gap is filled by the fossil man of Java, Pithecanthropus, in which the brain volume was 850 c.c. The Java man is a real missing link and in the sense perhaps Australopithecus is not a missing link, although the fact must be taken into consideration that the natural cast of the interior of the skull has suffered some damage and the individual had not attained maturity and it is believed that the brain of this specimen in the adult stage would exceed that of the gorilla. Probably, however, the size and marking of the brain cast fix the position of Australopithecus as a link in the evolutionary chain of anthropoid apes.

Two questions present themselves in relation to this discovery, that is to say to those who believe in the evolutionary origin of man, where does this being stand in the line of human development and, secondly, how far does this discovery throw any light upon the place of origin of the human race. It would be premature to pass an opinion on either of these points, which will no doubt be dealt with in the monograph by Professor Dart, which will be published shortly. However, with regard to man's place of origin this may be said.

The discovery of Pithecanthropus erectus in Java in 1891 and of fossil apes bearing some resemblance to man in the Himalayas have directed attention to the plateau of Central Asia as a likely locality. As a matter of fact, it is hoped that this is a question which the great American paleontological expedition now working in Asia may help to elucidate. But these recent discoveries in South Africa as well as that in Egypt of a fossil ape thought to be ancestral to both the simian genus and man, may require a modification and perhaps a total revision of existing views.

It may be added that Dart is the young professor of anatomy in the medical school at Johannesburg and was trained in London under one of the greatest anatomists of the world, Professor J. I. Wilson.

THE LEAGUE OF NATIONS AND MALARIA

In Eastern and Southeastern Europe, in many parts of which malaria is endemic, the disease extended its area and prevalence during the war and has continued to extend since the conclusion of the war. In districts of European Russia malaria is present during the winter and rife in the summer. In Macedonia, it is extremely prevalent, and the same may be said of Albania. It is therefore encouraging to learn that definite steps for dealing with malaria in Europe have been adopted by the League of Nations Health Committee, the second session of which has recently concluded in Paris. A subcommittee for several months has been dealing with the malaria problem. This subcommittee is shortly to visit Jugoslavia, Rumania, Russia, Ukraine, and Italy in order to gain full and reliable knowledge of the actual situation in the countries visited. At the request of the Albanian Government Dr. Haigh, a former member of the League Epidemic Commission, has been commissioned to complete a survey he has already begun of malaria in Albania, and to present a report on the basis of which the malaria subcommittee will prepare a technical plan for the use of the Albanian Government. The subcommittee is also receiving reports from Great Britain, Denmark, and Holland, where malaria has been stamped out or almost stamped out within recent times, as well as from those countries in Southeastern Europe where malaria has spread greatly since the war. With the preliminary knowledge gained from these investigations, it is hoped that an effective international campaign can be carried out. The question of the supply of quinine—it really is not so much the limited supply but the great cost—as well as the efficacy of quinine and other cinchona alkaloids, will also be studied. It was decided recently that an Epidemiological Intelligence Bureau should be set up in the Far East by the League of Nations. The Health Committee has recommended to the League Council that this Bureau should be established in Singapore.

Malaria is easily the most destructive disease to life and health known. There are other diseases, as plague, for instance, which are more fatal, but there is no disease which at the same time is so harmful to health and so widespread as malaria. Treatment is more or less futile so far as the abolition of the disease is concerned. There is no malady to which the old maxim—prevention is better than cure—applies so aptly as to malaria.

Ross, when he discovered the mode by which malaria was transmitted, showed himself to be perhaps the greatest benefactor of his age, as he pointed out also the way for its extirpation. He has constantly

preached that if the breeding places of the mosquitoes are destroyed, malaria will disappear. This is selfevident and has been proved times without number, but has rarely been carried out on large scale, the excuse being the vast cost of such undertakings. Of course draining marshes and swamps would be an immense expense, but if the outcome be regarded the question of expense fades into insignificance. Not only would the most debilitating disease of the world be abolished, but large tracts of land would be rendered fit for cultivation and in the long run the cost would be returned over and over again in health and prosperity. The malaria problem, as Ross himself has constantly pointed out, has never been grappled with in the only way which is certain to bring results and which would remove from the tropics one of the greatest drawbacks to lands of the Torrid Zone as places of residence for white men. Many of the worst diseases of the tropics are carried by insects and the prevention of such diseases can only be attained by getting rid of the hosts.

INFLUENZA

It is some years now since a pandemic or even a large epidemic of influenza struck terror into the inhabitants of the entire world, and it is curious to note how soon human beings forget the ills that have beset them, however grievous they may have been. In the instance of influenza it is unwise to let pass from the memory a disease of so far flung and protean manifestations, because it seems certain that another pandemic will occur, perhaps sooner than expected. The views as regards influenza are diverse, both as to cause and treatment. According to Crookshank in a work on influenza consisting of essays by several authors, which he edited and which was published in 1922, to ask what is influenza? and what is the cause of influenza? is unscientific regarded from certain viewpoints. He points out that when we speak of ascertaining the nature of influenza, and of discovering its cause, what we are really implying is the need for testing, in agreement with the method of science, the accord of our available experiences with the empirical generalization which is loosely expressed when we say there is a disease which we call influenza, and there is a need for further shaping and defining this empirical generalization in memory with our experiences.

However, perhaps the most moot point with respect to influenza is as to whether the socalled influenza bacillus, Pfeiffer's bacillus, is the cause of the disease, or what is the relation it really bears to the infection. Up to the time of the latest pandemic, Pfeiffer's bacillus was regarded generally as the cause, but the investigations taken in 1918 threw doubt upon this and the question now is thoroughly confused. In Crookshank's *Influenza* the matter of the bacteriology of influenza, with special reference to Pfeiffer's bacillus, is closely considered by Dr. Robert Donaldson, pathologist to St. George's Hospital. In fact, no such acute analysis of the problem has, perhaps, been done before or since. It may be mentioned that when Pfeiffer published his preliminary paper in 1892, some bacteriologists working along the lines he laid down were able to corroborate his findings. Others, notably in France, frankly refused to acknowledge that the bacillus was in any way chronologically related to the disease. Donaldson points out that all that Pfeiffer was entitled to infer from the facts stated in his papers is this, that in all the cases examined by him in November and December, 1891, amounting in number to thirty-one, the small gram negative bacillus isolated therefrom stood apparently in some etiological relationship, though whether as a primary or secondary agent it was not possible to say. Pfeiffer utterly failed to communicate the disease to animals, and lastly, the bacillus is not the only one of its kind, and the term Pfeiffer's bacillus may really connote, not one particular kind of bacillus, but a group of more or less closely related bacilli. Donaldson then proceeds to review in detail, in the light of research carried out during the pandemic of 1918, the reasons for or against the acceptance of Pfeiffer's bacillus as the cause of influenza. The review is done most thoroughly but owing to lack of space only a few points can be referred to.

MacCallum visited three different places in America in 1918, and made cultures from the lungs of persons who had died from influenza. He used the same technic and the same media throughout. At Camp Dix he isolated Pfeiffer's bacillus in one hundred per cent. of the twelve cases examined. At Camp Lee he recovered the bacillus in only thirty per cent. of the cases and two of the six positive were doubtful. Finally, at the Johns Hopkins Hospital he examined sixteen cases and failed to find Pfeiffer's bacillus in one. The inference to be drawn from a consideration of these various results obtained seems fairly obvious. Others engaged in investigating material derived from widely different sources simultaneously have had similar experiences. The failure can have only one meaning, that Pfeiffer's bacillus was not actually present in the majority of the cases of influenza examined.

Donaldson remarks that its absence in even a much smaller percentage would still invalidate the claim of the organism to be regarded as definitely causal for influenza. In short, Donaldson argues that whatever be the cause of pandemic influenza, all the observed facts go to prove almost conclusively that

it is not Pfeiffer's bacillus as classically described. He also thinks that there is not the slightest shred of evidence that the disease is due to a socalled filter passing virus, and he criticizes adversely other suggested causes. He draws attention to the fact that there is a very strong possibility that the assumption of a single specific and unvarying virus common to all cases of pandemic influenza is entirely erroneous. Morbid lesions in general are results of invasion of organs by living cells, whether of extracorporeal origin, bacteria and protozoa, or of corporeal derivation, the various tissue cells. So long as the first named remain on the outside of the body and the second observe their proper frontiers, the body is in a condition of health.

Much is known about the types of invading about the extraordinary diverse types of invading cells, the results of their activity after entry into the body, and the reactions induced thereby, but relatively little is known concerning the why of their invasion. Increased virulence is but a partial answer Donaldson suggests—is not the true solution to be found in an exact understanding of the mechanism of the first line of defence, and of how that mechanism may be altered by physical causes operating from without, and biophysical causes acting from within? Influenza provides a fruitful field for investigation and to a greater or less extent it is almost always with us, although apparently the type of the disease changes as the epidemic develops. How does the disease spread and are the popular views held by epidemiologists as to the manner of its spread correct? It is possible that the disease is not always spread by contagion. On the whole, influenza is the most mysterious disease known, the secret of which is still far from discovery.

CARBON MONOXIDE POISONING

An editorial in a recent issue of *The American Journal of Public Health* summarizes the dangers arising from the use of gas as fuel, and gives some statistics of deaths and asphyxiation from carbon monoxide gas from domestic heating appliances. The flueless gas heating stove is responsible for most of the poisoning in this country, and of these the so-called radiant heater has been found to be the most dangerous. Gas water heaters have also caused some deaths and asphyxiations.

During the winter of 1922-23 in Ohio there were sixty-four deaths and one hundred and thirteen cases of partial asphyxiation. Of these forty-one deaths and forty-six asphyxiations were due to heaters, generally of the radiant type. In the winter of 1923-24 there were in Ohio sixty-one deaths, forty-two of which were due to gas heaters. These statistics were compiled by the State Board of Health, and not taken from newspaper reports.

The best way to prevent asphyxiation by gas heaters is to have an abundant supply of flues to carry off the waste products. The heaters should be se back in the fireplace so that the flue in the chimne can carry off the fumes. Special care should b taken that the flue is kept open and unobstructed Water heaters in bathrooms are particularly danger ous on account of the small size of the rooms, and th fact that they are kept closed while in use. Instan taneous heaters are especially prone to generate car bon monoxide very fast. In a bathroom of ordinary size, enough gas can collect in fifteen minutes t asphyxiate a bather.

The automobile is another source of dangerous gas hence all garages should be well ventilated and hav doors opening outward. The engine should never b allowed to run in a closed garage, and it is espe cially dangerous to get under a car when the engin is running.

Since carbon monoxide gas has no odor, taste color, nor irritant action, it can be present in larg quantities without being perceived by the senses One tenth of one per cent. in the air will cause fata results in a few hours. "It has three hundred time the affinity for the blood that oxygen has, and form a stable compound with hemoglobin in the red bloo cells which is not easily broken up. In addition t the acute, there are many cases of more or les chronic poisoning, in which the symptoms may var from slight discomfort to extreme ill health. A wor to the wise is sufficient."

Obituary.

SIR EDWARD THORPE, C.B., D.Sc., F.R.S

London

Death has been busy of late among the scientific men of Great Britain. In succession to Sir James Mackenzie and Sir Clifford Allbutt, Sir Edward Thorpe, one of the best known chemists of his generation, died on February 23d. Like Sir Clifford Allbutt, he had reached a green old age as he was in his eightieth year. He was born near Manchester and after attending Owens College, studied at Heidelberg under Bunsen, and at Bonn. In recent years he will perhaps be remembered chiefly for his presidential address to the British Association in 1921 on the mechanism of the atom. Thorpe also did remarkable work in magnetic surveys and took part in four solar eclipse expeditions. He had held many offices in the learned societies of this country, and was a member of kindred bodies in America and Europe.

He had been president of the Chemical Section of the British Association of the Chemical Society and of the Society of Chemical Industry, Fellow, Foreign Secretary, and Vice-President of the Royal Society, and President of the British Association. Some of his works, such as *Chemical Problems, Inorganic Chemistry, Quantitative Analysis, Qualitative Analysis,* and *Dictionary of Applied Chemistry,* were generally regarded as authorities. An attractive and vivacious lecturer, Thorpe delighted in the study of the history of his science, and he published monographs on Dr. Priestley and Sir Humphrey Davy, *Essays on Historical Chemistry,* and a life of Sir Henry Roscoe, and a *History of Chemistry.*

News Items.

Red Cross Membership.—The American Red Cross announces a membership for 1925 of 3,360,000, a gain of about 237,000. With the exception of New England, the gain was general over the United States.

Typhoid Carriers.—A bill has been introduced into the Minnesota senate, providing that typhoid carriers who are prevented from earning a living, by health regulations, shall be eligible for compensation by the state. The industrial commission shall determine the compensation due in each case.

Crile Research Fellowships.—Two fulltime fellowships for the academic year 1925-26 are available for research at the medical school of Western Reserve University, Cleveland. Details may be obtained from the Committee on Medical Fellowships, Western Reserve University, 2109 Adelbert Road, Cleveland, Ohio.

Biggs Memorial Lectures.—As a memorial to the late Dr. Hermann M. Biggs, Mrs. Biggs has donated to the New York Tuberculosis Association an annual lecture on tuberculosis, to be given in New York by some prominent physician. The execution of the project has been transferred to the Medical Society of the County of New York.

Exhibition at Grolier Club.—An exhibition of early anatomical works was opened at the Grolier Club, 47 East Sixtieth Street, New York, on March 19th. The guest of the evening was Lt. Col. Fielding H. Garrison, of the U. S. Army Medical Corps, who said the collection of pre-Vesalian and Vesalian items surpassed anything of the kind he had yet seen.

Samuel D. Gross Prize.—The Philadelphia Academy of Surgery announces the award of the Samuel D. Gross Prize for 1925, amounting to fifteen hundred dollars, to Dr. John Alexander, Department of Surgery, University of Michigan Medical School, for his essay on "History, Present Practice, and Proposed Reform of the Surgical Management of Pulmonary Tuberculosis."

Neurological Institute Joins Health Centre.—The Neurological Institute has made plans for a new building near the Presbyterian Hospital and Columbia University medical centre, receiving land close to the proposed New York State Psychiatric Institute. The Neurological Institute, however, will not receive any of the money being collected for the centre, but will have to provide the money for its buildings. The present quarters on East Sixty-seventh street will be retained for diagnosis and observation. The president of the Institute, Robert Thorne, has become a member of the Joint Administrative Board.

Personal.—Dr. Joseph S. Halstead, of Breckenridge, Missouri, recently celebrated his one hundred and seventh birthday.

Dr. M. Joseph Mandelbaum has been appointed attending otolaryngologist to the Hospital for Joint Diseases, New York.

Dr. Frank G. Boudreau, chief of the division of communicable diseases of the Ohio Department of Health, has accepted the position of statistician-epidemiologist with the League of Nations.

Dr. George K. Pratt has become assistant medical director of the National Committee for Mental Hygiene, located in New York; he was formerly medical director of the Massachusetts Society for Mental Hygiene.

Dr. William W. Keen, of Philadelphia, celebrated his eighty-eighth birthday on January 19th. Doctor Keen is emeritus professor of principles of surgery and of clinical surgery at Jefferson Medical College, and has been in practice sixty-five years.

Dr. A. Strachstein has been appointed attending urologist to the Jewish Maternity Hospital.

Dr. Louis I. Harris, director of the bureau of preventable diseases of the New York department of health, has been elected president of the Association of Tuberculosis Clinics of New York.

Dr. Maximin de M. Touart has been appointed medical director of the Reconstruction Hospital, New York, and Dr. Seth M. Milliken, surgical director.

Dr. Virgil P. Gibney has been appointed surgeon in chief emeritus of the Hospital for the Ruptured and Crippled, New York, retiring from active duty after fifty-four years' service. Dr. William B. Coley has been appointed surgeon in chief to succeed him.

Medical Council for Visiting Nurses.—Dr. William Darrach, dean of the College of Physicians and Surgeons, is chairman of a committee of medical men to act as council for the Visiting Nurse Service of the Henry Street Settlement.

Rockefeller Foundation Gifts.—The Rockefeller Foundation has given 10,000,000 dinars (about $200,000) to Jugoslavia for the construction of a school of hygiene at Zagreb, the administrative capital of Croatia; $40,000 for the improvement of sanitary institutions in Belgrade, and $15,000 for the aid of needy students abroad who pledge their services after graduation to the public health service in Jugoslavia.

The American Board of Otolaryngology.—This board will hold its first examination during the meeting of the American Medical Association in Atlantic City, May 25th to 28th. According to its rules, applicants are divided into three classes: 1, those who have practised otolaryngology ten years or more; 2, those who have practised otolaryngology five years and less than ten years; 3, those who have practised otolaryngology less than five years. The examination is different for each class. The secretary is Dr. H. W. Loeb, of St. Louis, Mo.

American Psychopathological Association.—The fifteenth annual meeting of this association will be held in Washington, D. C., May 7th, at the New Willard Hotel. According to present plans the scientific program will be presented on the afternoon and evening, a subscription dinner to follow the afternoon program. A preliminary list of contributors to the program include Dr. Alfred M. Barrett, Dr. J. Ramsey Hunt, Dr. L. Pierce Clark, Dr. L. E. Emerson, Dr. Harry S. Sullivan, and Dr. Trigant Burrow. Dr. Sanger Brown, 2nd, is secretary of the association.

Approval of Pathological Laboratories.—To discourage commercial or unethical clinical and pathological laboratories, the Medical Society of the County of New York has made arrangements for granting certificates of approval when so warranted. The requirements are that the director of the laboratory shall be a licensed physician, and shall present an application blank from the Society, a license from the New York City Department of Health, and approval from the New York State Department of Health. Any form of division of fees or contract form of practice are prohibited, and display advertising is to be discouraged. Every facility to secure approval by the Society will be rendered on written communication to the Committee on Clinical and Pathological Laboratories, Medical Society of the County of New York, 17 West Forty-third Street, New York.

Society News.—The American Society for the Control of Cancer has elected the following officers: Dr. Howard Canning Taylor, president; Dr. Francis Carter Wood, vice-president; Thomas M. deBevoise, secretary, and Calvert Brewer, treasurer.

The Medical Women's National Association will hold its annual meeting May 25th and 26th at the Marlborough-Blenheim, Atlantic City. Women physicians attending the American Medical Association meeting will have their headquarters at the Marlborough-Blenheim; and will hold a banquet at the Ambassador, May 27th. Information may be received from Dr. Clara K. Bartlett, 4301 Atlantic Avenue, Atlantic City.

The Western Physiotherapy Association will hold its seventh annual meeting in Kansas City, Missouri, April 16th and 17th, under the presidency of Dr. L. A. Marty, of Kansas City. The Western School of Physiotherapy will hold its seventh annual session in Kansas City the preceding week.

At the annual meeting of the New York Electrotherapeutic Society, the following officers were elected: president, Dr. Norman E. Titus; vice-president, Dr. Harry E. Stewart; treasurer, Dr. J. Willard Travell; secretary, Dr. Richard Kovacs.

The American Association of Obstetricians, Gynecologists, and Abdominal Surgeons has elected the following officers: Dr. Asa B. Davis, New York, president; Dr. William E. Darnall, Atlantic City, and Dr. Henry Schmitz, Chicago, vice-presidents; Dr. James E. Davis and Dr. George V. Brown, both of Detroit, secretary and assistant secretary; Dr. William G. Dice, Toledo, treasurer; and Dr. James F. Baldwin, Columbus, Ohio and Dr. Edward A. Weiss, Pittsburgh, members of the executive council.

Foreign Correspondence.

LONDON LETTER

(*From our own correspondent*)

London, *February 20, 1925.*

THE APPROVED SOCIETIES AND HEALTH

The twelfth annual meeting of the English National Conference of Industrial Assurance Approved Societies, which have a membership of six million, was held on February 16th in London, with Mr. A. C. Thompson in the chair. In acknowledging the election Sir Amos Kirk, the president, said that national health insurance seemed destined to be the forerunner of other forms of national insurance, and probably the parent of that larger conception popularly known as "all-in insurance."

The provision of dental treatment as an additional benefit had proved an experiment of great value and would, he felt sure, be continued and extended. If, on financial grounds, dental treatment as a statutory benefit was found impracticable, he urged that the necessary sacrifice be made to provide dental treatment for all insured persons. While medical benefits might be extended to dependents of insured persons they must first see that they had provided their insured members with all the available aids for the prevention and cure of sickness before they attempted to extend the benefits. Sir Thomas Neill said that there were now thousands of insured persons suffering from tuberculosis, and he thought the societies should take up the work of obtaining better houses. One society alone had five thousand members suffering from tuberculosis, of whom one thousand were getting no treatment at all.

Mr. Neville Chamberlain, the Minister of Health, said that he had been making inquiries as to the scope of the societies' operations, and the results he thought would be somewhat of a surprise to the public, as they had been to him. He found that during the past year no less a sum than £14,000,000 had been paid in cash benefits and £10,000,000 in medical benefits. There were two other directions in which the assistance of the societies would be warmly welcomed. First of all, there was the position of the unemployed, and then there was the question of voluntary hospitals.

It was gratifying to find that the great efforts in the past had resulted in a considerable abatement of tuberculosis. They might fairly say it was on the decline today, and he hoped that it would be possible before he gave up the office to meet the difficulties of the problem. The conditions of housing had become absolutely intolerable, and they were doing all they could at the Ministry to develop the building of new houses on new methods. They believed that the question could no longer be dealt with by old methods, and it was their desire to see if they could find out in order that they might hasten the time when people would be able to live once more under favorable conditions of health.

NATIONAL DECAY AND REGENERATION

Dean Inge, who is known as the gloomy Dean because he does not gloss over the defects of civilization and of the people of Great Britain but who is really one of the clearest thinkers and most able speakers and writers of the country, spoke at Horsham, Sussex, on February 15th, on National Decay and Regeneration. He said he saw no reason whatever why a nation should grow old. If it perished it perished either from disease or violence. He said the history of the Roman Empire could be understood only if we realized that throughout antiquity civilization was in a state of siege. One assailant was malaria and another undoubtedly the internal disruption of the body politic.

The modern man might be a poor creature physically, but he had developed quite a new power of resisting microbes, and had become magnificently resistant to alcoholism.

As for the birth rate which was highest among the feebleminded, the Dean said the State did all in its power to increase the evil by throwing on the industrious the whole burden of maintaining in constantly increasing numbers the waste products of the social machine. We were breeding from the bottom and dying off at the top. If it were skilled workmen who were filling the cradles, there would be much less ground for alarm. It was the slum dweller, the untaxed dole receiver who was the father of the next generation.

There was no reason at all why a nation should not go on renewing its youth. That was not to say that we should always hold our present position as a great power. The area of our country was far too small. The future belonged to the large countries, especially to the United States, but the British Empire was a large country, and, taken together, ought to rank as one of the chief countries of the world. The race was far more important than the nation.

PRESERVATIVES IN FOOD

A somewhat stringent set of regulations with regard to preservatives in food has been incorporated into the new bill in this connection which is now coming before Parliament. These regulations have given rise to a considerable amount of discussion and many of those who deal in articles of food which contain preservatives are up in arms. Even some of the scientific authorities take the stand that so little is known concerning the deleterious effects of some of these preservatives and coloring matters, that it is unfair to prohibit their use. Boric acid is perhaps the preservative around which most of the controversy rages. However, it is undeniable that it is not fitting to add to articles of food any material not of the nature, substance and quality of food, which is the main contention of a Departmental Committee which has reported recently on the subject.

As Professor Henry G. Armstrong said the other day in an article published in the *Daily Telegraph*, the problem at the moment is how best to effect an economic compromise, so long as it be impolitic, if not impossible entirely to stay the use of preservatives. We know remarkably little of the action of preservatives, of the manner in which they serve to prevent objectionable changes. We are only clear that they hinder, if they do not suppress entirely, fermentative and putrefactive change.

Professor Armstrong enters into a discussion on the action of various preservatives commonly used, that is as far as is known, and points out that the fac-

tors at work in life are so numerous, it is so difficult to trace effects to their causes, that valid proof of injury will not easily be found. What we are learning is that the healthy body is built up during earliest childhood and that lost opportunities can never be regained. So that we should take every precaution not only to provide all that is necessary, but to avoid all possible sources of interference. In the case of marasmic children, the slightest interference may be fatal. He concludes that little as we know, vague as is our knowledge, all tends to show that we shall be wisehearted to avoid the use of preservatives as far as is possible. Attention may be directed to the fact that on the whole the laws as regards the employment of preservatives in food are more lax in this country than in America.

THE CAUSE OF TETANY

At a meeting of the Glasgow Royal Medico-Chirurgical Society held on January 26th, last, a discussion on tetany took place. Professor Leonard Findlay, after tracing the history of the disease, referred to the various hypotheses as to its pathogenesis and to the relationship of idiopathic tetany to tetania parathyreopriva and concluded by describing the investigations of Professor Noël Paton and himself, which have led them to the adoption of the guanidine intoxication hypothesis. Dr. Stanley Graham pointed out that the four main hypotheses held at present were: 1. Guanidine intoxication; 2. A disturbance of the ratio of sodium and potassium to calcium and magnesium; 3. Calcium deficiency; and 4. Alkalosis.

With regard to the guanidine intoxication hypothesis he was of the opinion that until more accurate methods for the estimation of guanidine were devised little further confirmation could be obtained. As for calcium deficiency, the association of a diminished calcium content in the serum with certain forms of tetany he had found to be by no means constant, and in two recent cases of active tetany the calcium content had been normal. Also in other forms of tetany, gastric and hypernoeic, the calcium content might be normal. In uremia with a low calcium content no instance of tetany had been recorded.

The disappearance of the signs of tetany on the administration of calcium chloride supposed to be due to the supply of calcium ions was now considered to be due to the acidosis produced. Ammonium chloride had been found to be as effective as the calcium salt, while calcium lactate failed to relieve the tetany. The acidosis of a gastroenteritis had been found to cause the signs of tetany to disappear. Dr. G. H. Clark believed the cause to be gastro-intestinal.

REVERSION OF £160,000 FOR MEDICAL RESEARCH

Mr. James Maxwell Grant Prophet, director of the Chartered Bank of India, who died in Calcutta on December 14th, last, left estate of the gross value of £219,793, the death duties bringing that amount down to about £160,000. He bequeathed £500 to the Staff Provident Fund of the Oriental Club and subject to a life interest his residuary estate for a trust fund of which one half is to be applied for inquiry into the nature, cause, prevention and treatment and cure of tuberculosis, and half for similar inquiry regarding cancer, as a board of special trustees shall decide.

LATIN AMERICA LETTER

(From our own correspondent)

BALBOA HEIGHTS, C. Z., *February 10, 1925.*

GUATEMALA REORGANIZES ITS HEALTH SERVICE

On the reorganization of the National Health Service of Guatemala, Dr. José Azurdia has been appointed president of the reorganized service and Dr. M. Muniz secretary. Following the example of other Central American countries, the Government of Guatemala is requesting funds from the Rockefeller Foundation for a cooperative campaign against hookworm and including other sanitary work. It is planned to run the campaign for at least five years.

The Rockefeller Foundation representatives are now doing some form of health work in practically all the countries of Central America. During the past year they have done exceptionally merited work against yellow fever in Salvador where an epidemic occurred the latter part of June, 1924. Had this epidemic gained headway, all the ports in Central America and the Canal Zone would have been menaced. Dr. Louis Schapiro, chief of the Hookworm Commission of the Republic of Panama and also a Rockefeller Foundation representative, is now on an extended tour of Central America studying the sanitary conditions in those countries.

VITAL STATISTICS OF THE CANAL ZONE

A total of 192 deaths occurred during the month of December, 1924, among the population of the Canal Zone and the cities of Panama and Colon, which is equivalent to an annual death rate of 18.42 per thousand. The leading causes of death were: pneumonia, thirty-three; tuberculosis, twenty-eight; nephritis, sixteen; organic diseases of the heart, sixteen; cancer, eleven. There were eight deaths from diarrhea and enteritis, five from bronchitis, and three from apoplexy. Of the total deaths, sixty-three, or thirty-three per cent. occurred among children under five years of age. There were twenty deaths among nonresidents of the Isthmus; these are not included in the above statistics.

There were 307 live births reported during the month, and thirteen stillbirths. Including stillbirths, this is equivalent to an annual birth rate of 30.71 in a thousand of population. Deaths among children under one year of age numbered forty-seven, giving an infant mortality rate of 153.09 in a thousand live births.

The total number of malaria cases reported during the month was ninety-nine. Of these, three were reported from Panama City, four from Colon, forty from the Canal Zone sanitated areas, and fifty-two originated outside of our unsanitated areas. Of the total, fourteen were employees, forty-seven were nonemployees, and thirty-eight were Army and Navy personnel. There were two deaths from malaria.

STRINGENT REGULATION ON ACCOUNT OF PLAGUE

Owing to the renewed presence of plague on the west coast of the United States and also on account of its ever prevalence in South America, the Chief Health Officer upon recommendation of the Chief Quarantine Officer has just issued the following instruction to shipping interests. The text of the instructions follows:

Instructions to owners, masters, and agents of vessels arriving at Canal Zone ports, and to all others concerned:

1. Attention is invited to the fact that bubonic plague is prevalent in many parts of the world and has recently occurred in certain important seaports of the United States. It is of the utmost importance to shipping interests that all practicable measures be taken for preventing the spread of this disease to noninfected territory, and it is imperative that the Panama Canal continue free from plague. Plague is primarily a disease of rats and from infected rats it is usually transmitted to man through the agency of the rat flea.

2. Inspections by the Quarantine Division reveal the fact that officers on many ships docking at Canal ports appear to be unacquainted with the details of the quarantine regulations relative to preventing the introduction of rats into the Canal Zone. This statement applies particularly to the placement of rat guards and the fending off of ships.

3. Metal rat guards of standard type, not less than three feet in diameter, must be applied to all mooring lines, must be in good repair, must fit the lines accurately, and must be approximated at all points. They must not overhang the dock and must not be nearer to it than six feet. Preferably they should be placed on the line about three feet from the ship. Where spring lines emerge from hawse holes and can not be protected with rat guards, then the hawse holes must be tightly covered with canvas or plugged with suitable material. Ships must be breasted off from the pier at least four feet unless other provisions are made by the Chief Quarantine Officer. Savealls, catchalls, cargo chutes, hose, and all other communications with the shore except gangways and properly rat guarded lines, must be disconnected from the dock when the ship is not working; gangways must be either raised at night or well lighted and guarded by a watchman.

4. The most common faults in the placement of rat guards on ships in the Canal Zone are:

a. Use, on double lines, of rat guards which were constructed to fit one line. b. Application of rat guards made for large hempen cables on small wire cables without first wrapping cable with burlap or other suitable material. c. Use of bent or broken guards which do not permit all openings in the disc to be closed. d. Placing rat guards too near the dock (less than six feet), thereby giving opportunity for rats to jump from cable to dock. e. Placing rat guards on crossed lines, or on lines close together, in such a way that rats may pass from one line to another, thereby allowing migration from one ship to the next, or from one ship to the dock by way of another ship's cable. f. Use of nonstandard rat guards, such as those with a diameter less than three feet or of conical shape. The conical guards soon fall out of position, enabling rats to walk over the edge and so get upon the docks.

5. Attention is invited to the fact that there are heavy penalties for nonobservance of quarantine regulations. While the Canal officials wish to facilitate shipping in every possible manner, they can not countenance nonobservance of regulations, thereby endangering the public health in the Canal Zone and on passing ships.

NEW LEGISLATION IN PANAMA

The National Assembly of the Republic of Panama has recently passed an organic law creating a National Health Department. This law has been signed by the President and immediately becomes active. A far reaching plan for the organization of this department has been drafted and presented to the President and his cabinet for study.

Dr. Luis Shapiro of the International Health Board has lent great aid in the drafting of the plan for the proposed Health Department and its far reaching activities.

Dr. R. M. Taylor of the International Health Board, who recently passed through Panama has gone to Costa Rica to take charge of the National Public Health Laboratory which was recently established in cooperation with the Rockefeller Foundation. This laboratory has been functioning for the past four months, and Dr. Taylor's directorship of the laboratory will be a large asset to the government of Costa Rica.

MALARIA IN THE ISTHMUS

On account of the recent development of a number of cases of malaria among the employees of the Canal Zone and the sudden death from this disease of the wife of an employee, the Health Department has issued a warning to all residents of the Canal Zone in reference to riding out into the unsanitated areas after night fall. The Health Department has frequently pointed out the danger of visiting the unsanitated areas of the Canal, yet it seems that the warning has been in various cases unheeded. It has been therefore considered necessary to repeat it. As compared with the early years of construction the Canal Zone has had few fatal cases from malaria, there are sufficient numbers to remind us that the Canal is not and probably never will be free from malaria bearing mosquitoes.

Owing to the curtailment of appropriations it is impossible for the Health Department to sanitate a very large area of the Isthmus but it does sanitate around the settlements for a distance of approximately one mile from the built up sections, this distance being considered sufficient to prevent the influx of the dangerous anopholes into town sites. The outer limits of the Zone are adjacent to the unsanitated areas so that a person just within the area of the unsanitated border is relatively less protected than those near the centre of habitation. It is considered extremely dangerous to leave the sanitated Zone, especially during the wet season and is not altogether safe at any time of the year.

HEALTH CENTRE ACTIVITIES RESUME

With the beginning of the new year increased activities in child welfare have occurred throughout the Isthmus of Panama. The examination of all school children has been completed and correction of the defects are now being conducted at the two main hospitals of the Canal. Parents are responding to the notices sent them relative to such corrections and scarcely a day passes that there are not less than five children undergoing operations for the different defects.

The centres for infants and preschool children have again opened up on both sides of the Isthmus and a new one has been formed at Pedro Miguel,

an important settlement. The mother's clubs are vitally interested in these centres and attend in large numbers.

A physician and nurse are on duty two afternoons a week for consultation. One of the large problems among the children of the Isthmus is the question of nutrition. The milk supply is relatively limited and only infants under two years of age or sick children can obtain the best supply of milk. A crusade has been on for some time to encourage parents to use milk powder supplemented with fruit juices.

Letters to the Editor.

SPLINT TREATMENT OF FRACTURES

NEW YORK, *March 11, 1925.*

To the Editor:

My attention has been called to a paper in the last issue of the MEDICAL JOURNAL AND RECORD by Dr. E. H. Bradford entitled "Splint Treatment of Fracture of the Neck of the Femur and Hip Disease." From this I quote as follows:

"It may be believed that freedom from plaster of Paris fixation aids in bone union. Before the introduction of plaster of Paris fixation, nonunion was little feared and bony union was to be expected, with joint stiffness, some shortening, and permanent disability. Since the introduction of plaster of Paris, however, nonunion is mentioned by several authorities," etc., the implication being that nonunion is now more common than in the past because of treatment by plaster of Paris.

The report of the two cases so successfully treated by the abduction splint is defective because it is not stated whether the fractures were of the intracapsular or extracapsular type. The distinction is important because it has been the accepted belief since the days of Sir Astley Cooper, long antedating the use of plaster of Paris, that intracapsular fractures were incapable of repair, while if one accepts the statement of Dr. Bradford's colleague, Dr. Cotton, all extracapsular fractures unite, irrespective of the character of the treatment. The abduction treatment to which Dr. Bradford probably refers as the plaster of Paris treatment is such, only in the sense that plaster of Paris is used to fix the broken bone after deformity has been corrected and the fragments apposed by distinctive manipulations. Atrophy of muscles and other tissue is an effect of disuse. It is no greater under plaster of Paris than when it is produced by traction, or even by the muscular restraint incidental to acute disease of an unsplinted joint.

Fixation of accurately apposed fragments of a transcervical fracture is absolutely essential to repair because it is an interstitial process unaided by external callus. Fixation for a time is desirable after reduction of the deformity of a fracture at the base in order to prevent excessive callus formation which explains perhaps "the joint stiffness and disability" which, according to Dr. Bradford, "was expected" before plaster of Paris was employed. Muscular atrophy is by comparison an insignificant incident. The point that I would emphasize is that fixation of the transcervical fracture is as essential to repair as it is to bone grafting, and its effect in causing bone atrophy will be the same whether it is attained by a traction splint or by the capsular tension and direct pressure assured by fixation in complete abduction.

Granting all the advantages claimed for the abduction splint its use in the treatment of fracture of the neck of the femur must be limited to the few who can procure the splint and are trained in its application. The abduction treatment by contrast is at the command of any competent surgeon and is effective in assuring the opportunity for functional repair in every type of fracture. It should become, therefore, the treatment of choice and routine, and the reports of results since it has come into general use in this and other countries disprove Dr. Bradford's suggestion that efficient treatment of the fracture is a cause of nonunion.

ROYAL WHITMAN, M.D.

FRACTURE OF FEMUR

EUGENE, OREGON, *March 11, 1925.*

To the Editor:

Thomas J. Maxwell, of Keokuk, Ia., in the early eighties was the first surgeon to use lateral extension, together with direct extension, either from above the knee or including the leg and muscles above the knee. Long strips of *mole* plaster applied on both sides of the thigh and knee, with leg free, or including the leg with plaster or that part with strips of silk, so as to give all extension from thigh and knee. The lateral extension on abduction was made with folds of silk placed on the inside of the thigh, with weight extension according to strength of muscles. The Thomas splint makes use of this same lateral extension without mentioning Thomas J. Maxwell. The article in the MEDICAL JOURNAL AND RECORD of March 4, 1925, by Dr. E. H. Bradford, does not give credit to Thomas J. Maxwell but gives the credit to the Massachusetts Hospital School and gives Dr. Gifford, Dr. Barrett, Dr. Fernald, Dr. Faxon, Dr. Griffin, and Dr. Hammond as references. Dr. Maxwell is dead. The product of his brain in giving the medical profession the lateral extension in fractures of the neck and head of the femur, used in any form of splint, will live forever.

GEORGE O'BRYANT DE BAR, B.S., M.D.

HISTORICAL MEDICINE

LONDON, W. C., *February 13, 1925.*

To the Editor:

Your contributor, Mr. G. Arbour Stephens, of Swansea, Wales, writing of Dr. Haighton's lectures on midwifery, suggests that had he continued his vivisection experiments he might have enunciated the germ theory, the credit for which Mr. Williams ascribes to Dr. E(verard) Maynwaringe, the author of a work on syphilis in 1673. Your contributor proceeds to ask, "Is Maynwaringe an old Guy's student? If so, the hospital can still lay claim to one who, with the words quoted, has been undoubtedly the first to enunciate in unmistakable terms the fundamental idea underlying the modern germ theory." Has your contributor ever heard of Fracastorius? And does he not know that Guy's Hospital was not opened until January, 1725, and that Everard Maynwaringe had then been dead a quarter of a century?

GEORGE C. PEACHEY, L.R.C.P.

10 RANDOLPH CRESCENT.

Book Reviews

HYPERSENSITIVENESS AND TOLERANCE

Infection, Immunity and Inflammation. A Study of the Phenomena of Hypersensitiveness and Tolerance, and Their Relationship to the Clinical Study, Prophylaxis, and Treatment of Disease. By Fraser B. Gurd, B.A., M.D., C.M., F.A.C.S., Montreal, Lecturer in Applied Immunology and in Surgery, McGill University. St. Louis: The V. C. Mosby Company, 1924. Pp. 329.

Although the relationship between hypersensitiveness and other immunological processes is by no means as yet fully determined, enough is already known about the phenomena of tissue hypersensitiveness toward foreign albuminous substances and tolerance (the state in which the tissues are rendered insusceptible to tissue irritation) to make the practising physician and surgeon acquainted with them. Both the hypersensitiveness and the tolerance may exist in the same individual.

Anaphylaxis, the first stage in the immunological reaction, may exceptionally endanger the life of an individual or person, but it also serves a useful purpose in that, as a result of the hypersensitiveness of the tissues to the complex protein molecules which constitute bacteria, the bacterial cell bodies are immediately recognized by the tissue as irritants. The tissues normally respond to irritant substances by focal hyperemia, accumulation of leucocytes, and phagocytosis of the irritant particles.

A proper appreciation of the phenomena of allergy and their relationship to anaphylaxis and tolerance, places the prevention and treatment of infection by bacterial or other protein preparations on a rational basis. Without it the production and control of alterations in the immunological state of an individual becomes, not only difficult, but even dangerous.

Only such matters are discussed as are of practical interest to the clinical practitioner. Only those characteristics of bacteria are studied as determine their pathogenicity and their power to stimulate reactive phenomena on the part of the host. This is probably the first publication to treat the subject matter in this very practical manner. Serology, in so far as it refers to technical methods for the identification of immune bodies, has been excluded. This is the first book on immunology to be written by a practising surgeon, showing that the principles of immunology are finding practical application in surgery.

After a general introduction on the defensive and offensive reactions of the body against irritants and on infection and infectious agents, a study of immunity and immunization is taken up. The general principles of acquired immunity are exemplified by the toxin antitoxin reaction. The term anaphylaxis is fully explained, both as it occurs in animals and in man. The physiology of anaphylactic shock is gone into exhaustively. The nature of transferred anaphylaxis, desensitization, tolerance, anaphylactogen and anaphylactoid phenomena are then discussed. There are various theories regarding the site (humoral or cellular) of the reaction between antigen and anaphylactic antibody. The nature of this reaction is fully explained. It is probable that no matter what the source of the protein antigen may be, the irritating substances so developed are identical in nature. It is therefore believed that it is t physical rather than the chemical characteristics the individual species of bacterium which determi its relative irritative properties, and that consequent induce specific vascular and cellular reactions on t part of the tissues. The function of the leucocyt in immunological processes must also be taken in consideration. Protein-lysin immunity, alexin (cor plement) and sensitizing substance (amboceptor) a the reactions depending on them are then describe Agglutinins and precipitins also have a practical a plication in the treatment of disease. The relatio ship of anaphylactin to other immune bodies is tak up. The hemocellular reaction and the value of t leucocyte count in diagnosis and prognosis are show The focal vascular and cellular reactions to irritan (inflammation) in certain diseases are emphasize Anaphylaxis, as encountered in man, is discusse exhaustively. The chapter dealing with the applic tion of immunity principles to the prevention a treatment of disease is most instructive, as is al that on the therapeutic guidance of the acute inflan matory reaction.

This book may profitably be added to the libra of every practising physician or surgeon.

DIABETES

Manual for Diabetics. By Gladys L. Boyd, M.D. (Tor. Director of Diabetic Clinic, and Clinical Assistant, Hosp tal for Sick Children, Toronto, and Marion D. Stalsmit Dietitian to the Diabetic Hospital for Sick Childre Toronto. Introduction by F. G. Banting, M.D., Ne York: Funk & Wagnalls Company, 1925. Pp. xi-90.

The education of the public in the matter of dia betes mellitus has recently taken the form of diabet manuals, of which many have been published. Wit them it is hoped that the severity of diabetes will b reduced. They help patients to understand their cor dition and to help themselves as well as the phys cian. This book is written in simple language.

The nature of insulin, the technic of its adminis tration and its dangers are described. The selectio and the weighing of food is carefully explained. Th seriousness of the complications of diabetes is em phasized. The technic of uranalysis is explaine About two thirds of the book is concerned with foo values (tables), diabetic recipes and menu planning It may also be profitably placed in the hands of thos who have charge of diabetic patients.

Diabetes. Its Treatment by Insulin and Diet. A Handboo for the Patient. By Orlando H. Petty, B.S., A.M., M.D. F.C.P., Professor of Diseases of Metabolism, Graduat School of Medicine, University of Pennsylvania. Wit Several Illustrations. Philadelphia: F. A. Davis Company 1924.

In the foreword, Dr. John B. Deaver emphasize the necessity of the internist and the surgeon. Th author has shown that "the surgeon, to a great ex tent, must rely on the judgment and experience of th internist, who has made the study of diabetes and it control his own."

The nature of diabetes, its diagnosis, causes an prevention are discussed. The relationship existing between normal blood sugar, renal threshold and

renal glycosuria is well shown. In the study of foods, their proximal principles, inorganic salts and, especially, the vitamines are given special attention. Instructions are given how to weigh and measure foods—which is very important. The method of estimating the food value of diets is well and simply explained, robbing this computation of all its assumed mystery. The estimation of the sugar in urine is explained in detail. Insulin and the method of its administration at home are presented in a very intelligible manner. A large number of sample menus, in which the bulk of the carbohydrate portion varies with the desire of the patient, the protein and fat remaining constant, are given. The food values of the various articles of diet are arranged in tables for ready reference.

THE MIND AND ITS MECHANISMS

Introduction to the Study of the Mind. By William A. White. Nervous and Mental Disease Monograph Series No. 38. Washington: Nervous and Mental Disease Publishing Company, 1924. Pp. 116.

This is one of the most useful books that has appeared in some time. Here we find a modern workable concept of the mind and its mechanisms. White goes back some five hundred thousand years and traces the mind in the making. He then shows the simple everyday workings and the devious pathways which may be taken—and why. He makes clear in his usual lucid manner some of the ordinary bugbear terms, such as identification, displacement, sublimation, projection, symbolization, conversion and many others. It is a book that any intelligent person may read with great benefit. Aside from the wide general interest it contains for the physician there is one chapter every physcian should read carefully—On Bad Thinking in Medicine.

When the physician finishes this interesting book he may well hand it on to his family and friends.

PRACTICAL LECTURE SERIES

Practical Lectures. Delivered under the Auspices of The Medical Society of the County of Kings, Brooklyn, New York. (1923-1924 Series). One Hundred and Thirty-Two Illustrations and Three Color Plates. New York: Paul B. Hoeber, 1925. Pp. xvi-484.

This publication is a new departure in the field of medical literature. Both the Medical Society of the County of Kings, Brooklyn, and the publisher are to be congratulated on this work. This Practical Lecture Series was published for the purpose of giving the general practitioner practical talks on various subjects, rather than formal papers, by teachers interested in special subjects. It is indeed a "valuable addition to the practitioner's working library." The illustrations are very beautiful. The range of subjects discussed covers practically the entire field of medicine and surgery.

Joseph A. Blake discusses The Surgical Abdomen. H. A. Bray writes on An Appraisal of Certain Physical Signs in the Diagnosis of Incipient Pulmonary Tuberculosis. The Treatment of Pneumonia is the work of Harlow Brooks. Appendicitis is discussed by W. F. Campbell. Surgical Diagnosis is assigned to J. B. Deaver and S. P. Reimann. R. L. Dickinson writes about Office Gynecology, which is very complete and instructive. J. Ewing discusses Rational Pathology and the New Therapeutics, emphasizing the value of pathology in the selection of therapy. The Common Skin Diseases are discussed by J. A. Fordyce, giving interesting illustrations and mentioning their treatment. R. S. Fowler writes on Diagnosis of Abdominal Tumors. S. G. Gant gives The Diagnosis and Treatment of the More Common Rectocolonic Diseases. Common Diseases of the Breast are discussed by J. E. Jennings. L. C. Johnson writes about Diabetes and Insulin. E. Libman, an authority on the subject, discusses Subacute Bacterial Endocarditis in the Active and Healing Stages. W. R. MacAusland gives the various causes of Backache. The investigation of The Chronic Diseases of the Joints is described by T. McCrae. H. O. Mosenthal discusses The Value of Tests for Renal Function in the Practical Management of Bright's Disease and Other Conditions. Everyday Bacteriology, the article by W. W. Oliver, describes bacteriological work that may be done by the general practitioner. Dry Labor, The Management of the Breech and Ectopic Gestation are discussed by J. O. Polak. J. C. Regan takes up The Contagious Diseases and Their Treatment. F. Tilney writes about the neurological aspect of Epidemic Encephalitis. Office Orthopedics is discussed by W. Truslow. The article on Medical Psychology by J. J. Walsh is very interesting. The Fundamental Signs in the Examination of Patients, by L. F. Warren, is valuable and illuminating. An index of the articles and authors is also given.

GASTRIC SECRETION

Histoire de la Secretion Gastrique. Par M. Loeper. Paris: Masson et Cie., 1924. Pp. 120.

This little book of Loeper's is a splendid exposition of how we have come to our present knowledge of gastric secretion. It was early suspected that gastric digestion took place as a result of mechanical trituration and by what was for a long time called coction, a process equivalent to simple cooking. As often happens, however, early writers tried to explain the entire process on the basis of one of those factors only, so that much controversy resulted between the proponents of each half truth. It was not until the eighteenth century that the presence of acid was discovered and for the next hundred years not only was the nature of this acid unknown, but it was regarded as a result rather than a cause of gastric digestion. The idea of a glandular secretion of acid juice had yet to be evolved. It remained for our own Dr. Beaumont to lay the basis of the modern conception of the process of gastric digestion and for the Russian Pavlov to produce a proper technic for its experimental demonstration.

The presentation is divided into six periods; the Galenic; the early chemical; the mechanical; the period of acidity (Reamur and Spallanzani); the period of hydrochloric acid and human fistulæ (Beaumont); and the period of pepsin and of experimental fistulæ (Schwann, Claude Bernard and Pavlov).

The book is well illustrated by numerous portraits of the men whose work is described. Incidentally, small as it is, it is perhaps the only individual volume exclusively devoted to a history of any one aspect of gastroenterology. If for no other reason than this it should be on the shelves of every specialist professing a real interest in this department of medicine.

ACCOMMODATION AND REFRACTION

The Errors of Accommodation and Refraction of the Eye and Their Treatment. A Handbook for Students. By Ernest Clarke, M.D., F.R.C.S. Fifth Edition. New York: William Wood and Company, 1924. Pp. i-iv, 1-251.

As an aid to practical refraction this little compact textbook contains in a legible and easily assimilable form practically all that one needs to know about the subject. The author succeeds in covering the entire ground of accommodation and refraction in a practical, terse and concise manner. In marked contrast to the general tendency of European ophthalmologists many of whom are still inclined to belittle the consequences of eyestrain as first elucidated by the American eye men, the author devotes an entire chapter to the subject of eyestrain, especially as related to the nervous system, and takes great pains to impress upon the reader that "the physician who is called upon to treat a socalled functional nervous disorder, and fails to eliminate the element of eyestrain, fails in his duty both to himself and to his patient, as there is no functional trouble that may not be due to eyestrain"—a dictum which though it may appear to some as somewhat farfetched, is in the immense majority of cases very near the truth, and often incontrovertible.

DEVELOPMENTAL ANATOMY

Developmental Anatomy. A Textbook and Laboratory Manual of Embryology. By Leslie Brainerd Arey. With 419 Illustrations. Many in Color. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 433.

This book fulfills its aim. It is a clearly told story of Mammalian intrauterine development. The form of the telling is suitable for the student and avoids the controversial style of many of the more ponderous tomes. For the laboratory, the chick and the pig embryos are described.

DIGESTION AND THE NERVOUS SYSTEM

Essays and Addresses on Digestive and Nervous Diseases and on Addison's Anemia and Asthma. By Arthur F. Hurst, M.A., M.D., Oxon., F.R.C.P. New York: Paul B. Hoeber, Inc., 1924. Pp. 306.

This volume is a collection of reprints on various topics. Hurst writes well and is always interesting. His papers on Addison's anemia and gastric disorders are of particular merit. The contributions to certain of the functional neurosis are stimulating in their attempt to correlate organic changes with functional malfunction.

WORK OF THE ROCKEFELLER INSTITUTE

Studies from the Rockefeller Institute for Medical Research. Volumes XLIX and L. New York, 1924.

These thick volumes contain reprints of papers which have appeared in various journals during the past year from the Rockefeller Institute for Medical Research, most of which have already been abstracted in the MEDICAL JOURNAL AND RECORD. They include investigations of various problems, as in the section from the Hospital of the Rockefeller Institute five of the papers deal with the studies on oxidation and reduction by pneumococcus, and others treat of the pathogenesis of rheumatic fever and its treatment by neocinchopen. The variety of the titles suggests the broad scope of work being carried on in these laboratories.

EPILEPSY

Clinical Studies in Epilepsy By Donald Fraser, M.D F.R.F.P.&S. (Glas.). New York: William Wood an Co.; Edinburgh: E. & S. Livingstone, 1924. Pp. 243.

This book is replete with archaic concepts enter tainingly told. The writer could not make muc progress with the supercilious attitude he takes to ward the psychology of the unconscious. Ancesto worship is more popular in the Orient.

INFANTILE PARALYSIS

Infantile Paralysis in Vermont, 1884-1922. A Memorial t Charles S. Caverly, M.D. Burlington, Vermont: Stat Department of Public Health, 1924. Pp. 375.

This book is a tribute to the splendid work done b Charles S. Caverly in his extensive studies on polio myelitis in Vermont. Aside from the local in terest there are general points of interest in the han dling of the disease *per se.* Many new and salien points on epidemiology are discussed as well as cer tain phases of treatment and prophylaxis which wer inaugurated. There are papers from the many work ers who fought the disease in the State of Vermont

ROMANTICISM

The Green Hat. By Michael Arlen. New York: Georg H. Doran Company, 1924.

If Winter Comes took Main Street by storm. *Th Green Hat* ought to invade Greenwich Village, Par Avenue, and whatever other haunts the *literati* favor It has charm, wit; Arlen tells as romantic a story a anyone could wish. We all love to dream abou great loves, great lovers, and the exquisite Helen o the Green Hat—*pour le sport* is no passive pawn o men's passions.

There is a cult of courageous women in book these days, something between the flapper and th Amazon, riper than the former, mellower than th latter. She appeals to women readers who see i her the tenderness of a great spirited lad, to men wh ache for beauty beyond their eyelids' fall. *The Gree Hat* has a wholly fantastic realism of its own, pos sible yet incredible, an unhappy faroff strain playe in a muted minor key.

To interweave fantasy and fact, to clothe the sor did in sympathy, even to cram sheer beauty into ou busy lives has been Mr. Arlen's successful goal. O rather perhaps he has pleased himself. His reader are also pleased.

A NOVEL

The Eternal Huntress. By Rayner Seelig. New York Alfred A. Knopf, 1924.

After a crude beginning, this novel gathers mo mentum and with it ease until it crashes to a climax with the reader's interest rapt! A wonderful prac tice book for the student of novel construction Every law has been scrupulously observed, and in spite of its constructive values the book has a per sonality of its own. It could be hopelessly trite but it just escapes, it could be dull as only the social stuff can afford to be dull, and it evades the danger neatly. It is certainly not what one could call "a rattling good story." The author still takes himself and his creatures too seriously. But it is pleasing Isabel, sculptress, and her novelist friend are equally lovable, while the curt, older sister and the scheming stupid little adventuress are the necessarily shadowy stepsisters of a Cinderella dream.

Medicoliterary Notes.

A new weekly, *The New Yorker,* has recently made its appearance. Its aim will be to picture metropolitan life a "gay, humorous, satirical" way, yet not to be solely in "a jester." Judging from the first issue, it will deal largely with news of a personal nature about interesting people, and will have an unusually large number of departments and columns, among them, "Of All Things," "Talk of the Town," "Profiles," "The Hour Glass," "The Theatre," "Music," "Books," "Moving Pictures." The staff of advisory editors includes Alexander Woollcott, Ralph Barton, Dorothy Parker, Marc Connelly, Alice Duer Miller, Rea Irvin, and George Kaufman.

* * *

Among addresses of medical interest delivered at the latest annual meeting of the Association of Life Insurance Presidents, held on December 11th and 12th in New York, were the following: Progress of the Warfare Against Disease, by Dr. Oscar H. Rogers, medical director of the New York Life Insurance Company; An Effective Agency for Promoting Periodical Health Examinations, by Dr Franklin H. Martin, chairman of the Board of Directors of the Gorgas Memorial Institute of Tropical and Preventive Medicine at Chicago; and Protect the Individual in the Middle Span of Life, by Dr. Charles H. Mayo, head of the Mayo Clinic at Rochester. Among resolutions adopted was one expressing support of education in the evils of narcotic drug addiction. The proceedings of this meeting have been printed, and include reprints of the above addresses.

* * *

Dr. T. Gilbert Pearson, president of the National Association of Audubon Societies, who sailed recently to attend the coming convention of the International Committee for the Protection of Birds, is quoted as having stated that America leads the movement in saving the birds of the world. Ten and a half million song birds are killed yearly in Belgium alone, and in Italy one of the favorite sports is the netting by the wholesale of small and song birds.

* * *

In the recently issued annual report of the Dean of the School of Medicine of Columbia University there is a note of special interest regarding the organization of a complete series of postgraduate courses which have been carried on in conjunction with the Department of psychiatry. These courses represent the neurological participation in the general plan of the Medical School to offer postgraduate opportunities in all branches of medicine. This is probably the first organized attempt to give a full neurological and psychiatric schedule, so the report says, for postgraduate students in neurology and psychiatry.

* * *

Reports from the Associated Press state that the Soviet Government has recently taken steps to excavate under the towers of the Kremlin in Moscow for the famous hidden library of Ivan the Terrible who lived during the middle of the sixteenth century. This library is reported to contain eight hundred volumes bound in pure gold, and many Arabian, Persian, Assyrian and Byzantine manuscripts and parchments of priceless value. The existence of such a library has been a known fact for centuries, but its exact location has always remained a secret.

* * *

The British press has contained of late a number of editorial tributes to the late Dr. Sigerson, eminent nerve specialist and professor of biology at University College, Dublin. Dr. Sigerson was well known also as a poet, journalist, and historian and a statesman of unusual prominence in the Irish Parliament.

* * *

The latter part of this month a part of the famous Britwell Court Library, formerly the property of S. R. Christie Miller, will be sold at auction in London. It is reported that one of the earliest medical textbooks will go under the hammer at this time. This is *The Treasure of Poor Men,* printed in 1526 by Richard Bankes. As was customary in those days, the subtitle goes on to explain the contents of the work as follows: "Here Begynneth a Newe Boke of Medecynes Intytulyd or Callyd the Treasure of Pore Men, which sheweth many dyuerse good medecines for dyuerse certain dysseases as in the Table of this present boke more playnly shall appere." This is the earliest known edition of this book.

* * *

Dr. Donald B. Armstrong contributes an interesting article to the December issue of *The Nation's Health* on Social Workers and the Health Examination Movement. Dr. Armstrong feels that the extensive national campaign for periodic health examinations now under way is the social worker's great opportunity for putting over ha contribution to public health.

* * *

Two interesting articles on the subject of public health nursing have appeared in the December and January numbers of *The Nation's Health.* The first, entitled A Health Officer's Idea of a Public Health Nurse, is by Dr. John J. Sippy, district health officer of Stockton, California; the second, Definition of a Public Health Nurse, is by Mary Elizabeth Davis, supervising nurse of the Civic Center of San Francisco.

* * *

An editorial note in a recent issue of the *Manchester Guardian Weekly* reports some interesting observations on the effect of a theatrical performance upon an audience in one of the big London mental institutions as made by an actor. One of Pinero's plays was lately given before an audience of a thousand patients. "The chief difference noted between the reception of the comedy by the patients and that by an ordinary audience was that there was constant applause during the performance, and the exit of each player was cheered, not ironically but appreciatively, while at the curtains there was no applause at all. This is of course the exact reverse of what usually happens in a theatre, where interruption point by point would be resented. It might be supposed that the absence of demonstration at the end of the acts was due to an obvious cause,—that the audience did not think it worth while—but this will not do, as there was the greatest enthusiasm at all other times."

* * *

"There are in the United States 40,504 physicians, 191 surgeons, 5,139 apothecaries, 465 chemists, 2,923 dentists, 19 oculists, and 59 patent medicine makers," states *The Dental Monitor* for February, 1885, a Philadelphia publication. According to the *American Medical Directory* there were in 1923 in the United States 145,966 physicians, or one physician approximately to every seven hundred persons.

* * *

Dr. Saxon Pope, of the department of surgery of the University of California, will make one of the party, the other members of which are the author, Stewart Edward White, and Arthur Young, motion picture director, which is to go to British East Africa, where they will hunt lions, tigers, elephants, jaguars, deer and other large game with bows shooting steel barbed arrows.

* * *

The social welfare agencies of Vienna have instituted a "bride's course" to be held in the evenings principally for working girls. This step was taken as a measure for prevention of the many unhappy marriages caused by the modern bride's lack of knowledge of the elementary duties of housekeeping.

* * *

Thomas Jay, the famous writer of *Punch,* recently delivered before the Bristol Rotary Club a Short Discourse on the Alarming spread of Spinal Curvature in Oysters. He complained that, what with historians so minutely describing the past, and Sir Arthur Conan Doyle so clearly foretelling the future, there is nothing left to be uncertain about but the present.

* * *

Only eight minutes are required for New York City ambulances to respond with full medical staff aboard, to emergency calls. This eight minutes covers the time from reception of the call until the ambulance is at full speed. During the year just closed more than 125,000 calls were answered from all of New York's hospitals that provide ambulance service. Acute alcoholism was the cause of the majority of the calls for stricken people, next came insanity, and third pneumonia.—*Report of United Hospital Fund.*

Abstracts from Current Literature

NEUROLOGY

Application to the Cerebrospinal Fluid of the Complement Fixation Test for Gonorrhea in Obscure Cases of Nervous Disease.—F. Green (*Journal of Laboratory and Clinical Medicine,* August, 1924) has made a series of investigations in regard to the reaction of the cerebrospinal fluid to the complement fixation test in cases of gonorrhea, with a number of positive reactions. The following statements are made with regard to the behavior of the cerebrospinal fluid obtained from cases of gonorrhea of the nervous system: Usually the blood serum and cerebrospinal fluid give parallel results, though often the cerebrospinal fluid may give a strong postive complement fixation for gonorrhea, while the same reaction on the blood serum may be negative. The cell count and globulin of the cerebrospinal fluid may remain normal or slightly increased, in spite of a positive complement fixation for gonorrhea, nor does the colloidal gold test of Lange and the colloidal mastic test of Emanuel appear to be affected by a positive reaction for gonorrhea; though in the case of the colloidal gold reaction there may be a slight reduction in the midzone. The study indicates that here is a method by which gonorrhea of the nervous system may be diagnosed.

Treatment of Postencephalitic Parkinson Syndrome with Hyoscine Hydrobromide. — Leslie B. Hohman (*Bulletin of the Johns Hopkins Hospital,* October, 1924) reports on the condition of eighteen patients treated with hyoscine hydrobromide. They were all cases of the Parkinson syndrome following epidemic encephalitis. All showed objective improvement. The maximum amount of the dose was one fiftieth grain four times a day; the average dose was about one one hundredth grain four times a day. It was not necessary to increase the dose because of any acquired tolerance for the drug. Hyoscine proved a valuable palliative remedy in these cases.

Multiple Neuritis, with Korsakoff Syndrome, Following Hyperemesis Gravidarum.—Charles A. Cline (*Medical Clinics of North America,* July, 1924) draws the following conclusions: Toxic multiple neuritis is a frequent sequel of hyperemesis gravidarum. Therapeutic abortion is perhaps too long deferred in many cases of hyperemesis gravidarum, and is the best remedial measure and the most sure means of preventing multiple neuritis. A psychosis of the Korsakoff type is prone to occur in this type of multiple neuritis. The prevention of contractures in the paralyzed limbs is an essential part of the treatment of this condition, and persistent forcible extension will suffice to overcome them should they occur.

Encephalitis Lethargica with Diplopia as an Early Sign.—C. W. Yow (*Lancet,* June 21, 1924) states that in view of the one hundred per cent. of diplopia in his series, encephalitis lethargica should be borne in mind by the general practitioner in every case of "double vision" encountered. Several of his patients consulted their doctors for diplopia, but the real nature of the disease was not suspected. These cases are frequently overlooked in the mild and ambulatory cases unless a systematic inquiry is made into the history.

Postencephalitic Behavior Disturbance Without Physical Signs.—Bert I. Beverly and Mandel Sherman (*American Journal of Diseases of Children,* June, 1924) maintain that even in the absence of definite neurological findings or a history of an acute disease, or both, when a child shows a sudden change of personality and symptoms of impulsive delinquencies and childish mannerisms, the appearance of deterioration in contrast with a high mental test rating, explosive reaction, with general hyperkinesis and irritability, or marked indifference with sluggish physical reactions, the possibility of an organic brain disease, especially postencephalitis, should be considered.

Backache; Unilateral Sacralization of the Fifth Lumbar Vertebra.—Heinrich Martius (*Zentralblatt für Gynäkologie,* July 19, 1924) calls attention to an unusual and peculiar cause for a persistent form of backache—that due to unilateral sacralization of the fifth lumbar vertebra. The modern theory of constitution correctly attributes pains in the back very frequently to asthenia, especially in the presence of musculature that is easily exhausted, in which case the seat of the pain is attributed to the musculature itself by some and to the vegetative nervous system by others. However, local causes, especially the more latent factors must be taken into consideration. As an example of such a cause the author cites the case of an assimilation between the last lumbar and the first sacral vertebræ. The treatment includes diathermy, faradization and röntgen irradiation directed against the secondary inflammation. Surgical intervention has also given good results, but this procedure is associated with great difficulties.

Migraine.—Arthur F. Hurst (*Lancet,* July 5, 1924) nearly always obtained considerable improvement and frequently complete cures in his cases of migraine since he thoroughly examined his patients for ocular defects in addition to giving the usual medicinal and general treatment. He found that hyperopic astigmatism, especially when associated with latent hyperopia, is the most common error of refraction encountered. Astigmatism, which is generally compound, is very rarely entirely absent. Very small errors are quite sufficient to give rise to migraine, especially in highly strung, clever people with an irritable migraine storm centre. For this reason the most accurate possible correction of every error is required.

Phosphate Ratio in Mental Disease.—William Moodie and Eileen A. Boyd (*Lancet,* August 2, 1924) draw three main conclusions from an analysis of their results: 1. There is a definite type of confusional insanity which always shows the socalled acidosis reaction. This occurs at all ages and the prognosis is usually good. 2. The numerical value of the phosphate ratio remains constant in each case during the confused period. 3. An acidosis reaction is not uncommon in excited states, but this does not apply to manic depressives. The phosphate ratio may, therefore, prove to be a valuable aid to prognosis. Several methods of combating the acidosis as a therapeutic measure have been devised, but it is, as yet, too early to express any definite opinion as to their efficacy.

Compression Paraplegia and Pott's Disease.—C. Wallace (*Journal of Bone and Joint Surgery,* July, 1924) draws the following conclusions from his study of numerous hospital cases. Paralysis rarely developed when the focus of disease was below the tenth dorsal vertebra or when efficient orthopedic treatment and care had been administered. The Calot plaster of Paris jacket with pressure pad of plaster of Paris bandage and cotton, or Bennett's felt pressure block offers the best and surest method of a cure of the paralysis as well as the greatest promise to cut short its duration and reduce the deformity. The improved method of the treatment of Pott's disease and its early diagnosis have acted as a control in preventing the paralysis. There has been manifested a decrease in the occurrence of Pott's disease, which might warrant one in inferring that other forms of bone tuberculosis have correspondingly diminished in New York. A complete eradication of this infection may not be expected but the minimum appearance of this deforming disease is being rapidly approached. The author believes that this is accounted for either through the therapeutic and prophylactic programs as carried on by the various health and philanthropic organizations or by having the child's resistance to this disease raised to a maximum through the numerous activities of child welfare organizations.

Thrombosis of the Cerebral Sinuses Following Pneumonia and Other Morbid Conditions.—W. G. Wyllie (*British Journal of Children's Diseases,* April-June, 1924) states that sinus thrombosis is seldom recognized clinically except in those cases which are of otitic origin. This is due to the fact that its symptomatology is common to other conditions which are more frequently met with, such as meningitis and cerebral abscess. The diagnosis may be aided by an examination of the cerebrospinal fluid. It is almost certain that sinus thrombosis may arise from causes other than inflammatory. The strongest evidence in support of this theory is the possible occurrence of thrombosis of the sinuses in cases of chlorosis. Factors operating to bring about such a result are an altered state of the blood, weakness of the heart, and degenerative changes in the intima of the bloodvessels. Cases secondary to middle ear disease are amenable to surgical treatment. Recovery in any other type of cases is of exceptionally rare occurrence.

Backache from Vertebral Anomaly.—T. A. Willis (*Surgery, Gynecology and Obstetrics,* May, 1924) presents the following summary of his findings. Though the human spinal column is the most stable of the primate columns, it still presents frequent variations from the normal type. These variations result from an evolutionary shortening of the column by cephalad progression of the pelvic girdle complex upon the column. The articulation of the girdle with the column is, therefore, a region of morphological instability as evidenced by the frequent occurrence of development anomalies. Spinal columns thus affected are predisposed to mechanical derangement the symptoms of which are essentially ligamentous in origin. The anomalies may be divided into two groups, one of which involves the last lumbar segment alone and the other the articulation between this segment and the first sacral. The former includes various types of interruption in continuity of the neural arch, and the atypical transverse process. The defect of the arch is responsible for the occurrence of spondylolisthesis and kindred disorders. The latter group comprises the abmodal developmental formations of the articular processes. Each group gives rise to definite clinical syndromes. The form of treatment and prognosis depend upon the individual case.

Minor Injuries of the Brain.—Wilfred Trotter (*Lancet,* May 10, 1924) believes that, just as with other viscera that are inclosed in serious membranes, the most effective stimulus producing pain is stretching. Alterations in intracranial pressure and inequalities in its distribution as a result of the arrangement of the septa of the dura produce alterations in tension. Headache of organic origin is the result of disturbances of the intracranial pressure. The reduction of intracranial pressure is rarely the cause of headache. Owing to the arrangement of the dural septa, a local reduction may produce painful stretching until the pressure has become equalized, as occurs in cases of headache following lumbar puncture and the withdrawal of spinal fluid. If the disturbance of intracranial pressure is severe or rapidly progressive the headache is continuous with moderate disturbance, or if it is stationary or slowly progressive, the headache is paroxysmal, as in cases of some slowly growing tumors early in their development and characteristically in traumatic headache. When the headache follows an injury and resulting concussion, the brain is edematous. If the headache follows a localized blow on the head the brain shows localized bruising when exposed.

Surgical Repair of Peripheral Nerves.—H. Delageniere (*Surgery, Gynecology and Obstetrics,* November, 1924) offers his study of three hundred and seventy-five cases, and points out that the earlier the suture is performed the more rapid is the regeneration. The correctness of this statement is proved in the case of causalgia treated by resection followed by immediate suture and in the case of suture made at the time of injury. In the case of delayed suture, the regeneration is simply delayed, but eventually it should be just as complete. The author says that complete and excellent results have been obtained in the case of a suture performed as late as twenty-eight months after the injury. No matter how old the wound, it is worth the trial of operation. The regeneration appeared to be much quicker when there was complete physiological interruption but no separation of the ends of the nerve. With the separation of the two ends, regeneration is less rapid, just as in the case where the peripheral segment was very markedly disorganized.

The radial, musculocutaneous, and external popliteal nerves regenerate most quickly. The internal popliteal, the ulnar, and the median regenerate with greater difficulty. This is due to the fact that there is a greater number of sensory fibres which go to make up the nerve and to the danger of aberration of the nerve fibres in the new formation. The motor fibres grow down into the open sheaths of the sensory fibres, and vice versa. This produces a type of useless regeneration.

The suture must be done in a simple manner using very thin straight or small curved intestinal needles. Use very fine silk. In making the suture avoid transfixing the nerve, the stitches are put through the nerve sheath without touching the nerve itself. The main effect of this suture is to approximate the ends and at the same time to prevent any overlapping. As this suture is made to hold in slight tension, catgut should never be used because it may absorb before the fusion of nerve elements occurs. Physiologists have shown that the union of a sutured nerve occurs soon, but is not firm until after four weeks. After this period a sutured nerve cannot be torn off by the normal motions of limbs, even if it was sutured in flexion, and there is no danger in putting the limb through gradual progressive movements of extension.

In order that the different bundles correspond with each other at both ends, it is best to establish a landmark. Thus one stitch is made in the posterior middle part and the needle perforates the neurilemma about two millimetres deep. Two more stitches are inserted so that the first will be in the median line. Then the first one should be tied. The nerve is then allowed to assume its normal position, so that both ends come together. The suture may be completed with two or three more interrupted sutures.

1. In grafting, dissect the musculocutaneous nerve in a length double that needed in the graft. 2. Divide the nerve in two pieces of equal length. 3. Transfix these two ribbons with fine silk. 4. Suture the graft in such a manner that its ends fit like parts of the nerve. 5. Do not tie the sutures too tightly.

Spontaneous Subarachnoid Hemorrhage. — C. P. Symonds (*Quarterly Journal of Medicine,* October, 1924) treats of the clinical and pathological aspects of spontaneous subarachnoid hemorrhage from a study of 124 cases found in the literature, and places on record three new cases of his own, discussing the anatomical pathways by which blood may gain access to the subarachnoid space. The differential diagnosis and treatment are described, as are some of the various hypotheses which have been advanced to account for this condition. The author believes that intracranial aneurysms are a more common cause of spontaneous subarachnoid hemorrhage in young people than is generally supposed.

Treatment of Spasmodic Torticollis.—K. G. McKenzie (*Surgery, Gynecology and Obstetrics,* July, 1924) reports a case in which operation was performed by Dr. Harvey Cushing, of which he says: Intrameningeal division of the right spinal accessory, together with the combined trunk for each of the three upper right cervical segments was performed. Great improvement followed the operation. Intraspinal division of the posterior roots only of the upper cervical nerves, leaving the anterior roots intact, is suggested. It is thought that by this means the spasm in the posterior muscles, as seen in torticollis, could be markedly diminished, if it could not be entirely abolished, and that the weak active function of these muscles would still be retained.

Regeneration of the Meninges.—M. Lear and S. C. Harvey (*Annals of Surgery,* October, 1924) deduce from their experiments that the lining cells of the piaarachnoid are more highly differentiated than those of the dura and therefore are more stable in character. The lining cells of the dura are mesothelium derived from the mesenchyme, are less stable and readily enter into any adjacent inflammatory action. When destroyed they are replaced by the transposition of mesenchymal elements into mesothelium. The inner surface of the dura does not act as a limiting membrane in the presence of an attempted repair in the underlying meninges, but on the contrary enters intimately into the process. Consequently the piaarachnoid when injured becomes adherent to the dura, and heals with adhesions.

Treatment of Brain Abscess.—J. E. J. King (*Surgery, Gynecology and Obstetrics,* November, 1924) thinks that various operative procedures heretofore described, in which numerous kinds of drainage materials were used, have usually been followed by a high mortality rate. In all of these procedures described, prevention of hernia cerebri has been desired. The author advises the creation of a rather large cranial defect directly over abscess cavity; complete "unroofing" of cavity; complete herniation or eversion of cavity; prevention of trauma and early compression of hernia cerebri; adhesive plaster strapping; epithelialization.

Rigidity of Striated Muscle in Spastic Paralysis.—J. I. Hunter (*Surgery, Gynecology and Obstetrics,* December, 1924) emphasizes his belief that the basic principle of the operation of sympathetic ramisection is that it removes plastic tone. It is indicated only when plastic tone is in excess and hampers the voluntary activities which have persisted in spite of the central lesion. A study of the nature of the spasticity of the spastic limbs, and an estimate of the anatomical defect of the central mechanism responsible for the condition, must go hand in hand, and only when the physiological indications are discoverable is the operation to be undertaken.

Treatment of Spastic Paralysis by Sympathetic Ramisection.—N. D. Royle (*Surgery, Gynecology and Obstetrics,* December, 1924) following up experiments on animals to determine the function of the sympathetic nerves, now performs the operation on humans with encouraging success. The operative technic of lumbar sympathetic ramisection, abdominal sympathetic ramisection, and cervical ramisection are given, and the results which the author has achieved in his own numerous cases.

Cerebellar Abscess of Otitic Origin.—W. P. Eagleton (*Surgery, Gynecology and Obstetrics,* November, 1924) enumerates the objections, as he sees them, of both the ordinary operative treatment and Bourget's operative treatment of this complication. In their place he submits a technic of his own, which, with his comment upon it, follows. The operation is begun by uncovering the dura over both cerebellar hemispheres, followed by an exposure of a lateral sinus of the affected side. A clean area is obtained by approaching the sinus from behind after which the sinus is obliterated by the invulsion of its outer wall into its cavity, just below the knee; and by an encircling ligature in its lower portion. This procedure will admit of a free incision of the dura through the walls of the sinus, with enlargement anteriorly or posteriorly into the contiguous dura surface, and this in many cases in an uninfected area. The author says that his experience with this method is still too limited to warrant the statement that the mortality from cerebellar abscess will be improved by its adoption, but he believes that theoretical considerations and the high mortality from other methods certainly justify its trial in suspected cerebrellar abscess especially during the socalled latent period, when a positive diagnosis of cerebellar abscess is impossible and when consequently exploration by the recognized methods may not be warranted because of the risk of infection of the meninges.

Headaches of Intranasal Origin.—A. W. Greene (*International Journal of Medicine and Surgery,* October, 1924) considers the variety of pressure points that may cause headache. Severe and sometimes constant headaches may be caused by the mere pressure of an inferior turbinate on a septum, though the more common form is produced by pressure between the middle turbinate and the septum, either from hypertrophy or engorgement of the former or deflection of the latter, or both. There are socalled reflex spots in the nose, apparently more sensitive in the female. These areas hypertrophy during the menstrual period, and should there be an already decreased space, the result is not infrequently headache. Dysmenorrhea has been relieved by cocainizing these areas.

Turning our attention to the middle turbinate alone we can have a hypertrophy or malposition which causes a pressure on the lateral wall. The pressure alone can produce pain, referred through Meckel's ganglion or to the ophthalmic, but more frequently the headache is due to a blocking of the frontal sinus and anterior ethmoid cells. Hypertrophy and malposition have less to do with involvement of the posterior ethmoids, except indirectly—in other words, the headache is rarely from direct pressure of the turbinates. It is more the congestion or pus pressure due to improper drainage induced by hypertrophy or malposition. The anterior and posterior ethmoids may be separately involved, but more frequently are jointly affected. This pain is between and in the eyes, at the vertex, and there is danger of optic nerve involvement. Going back to the sphenoids, headache only results from congestion, hyperplasis, pus and negative pressure. Malposition plays no part and pressure between the turbinates and septum is not a factor (except causative for the sinusitis). The most confusing is the frontal headache of sphenoid origin—probably due to direct pressure on, or toxic envolvement of, the first division of the fifth, or even the semilunar ganglion itself.

The diagnosis is made by careful history taking, inspection (direct and indirect), aided by transillumination, x ray and cocainization. The latter not only dulls the pain, but shrinks tissue, thus aiding inspection.

The treatment, of course, depends on the diagnosis, which can only be arrived at after long and painstaking differentiation. Each point of pressure must be relieved, if possible, temporarily, so that we may determine whether permanent removal of such pressure will or will not cure.

Depletion of turgescent tissue will very often reduce points of pressure, so that no operative removal will be necessary.

MALIGNANCIES

Cancer of the Cervix.—Sidney Forsdike (*British Medical Journal,* July 19, 1924) draws the following conclusions:

1. That for cases of carcinoma clinically limited to the cervix the only treatment is operative.

2. That for cases which have clinically invaded the peri-cervical tissues the treatment is by radium to the cervix and x rays to the pelvic tissues.

3. That salts of copper play an important though subsidiary part in the treatment by radium.

4. That preoperative and postoperative irradiation is of considerable value.

Melanoma of the Nail Bed.—T. Banford Jones (*Annals of Surgery,* December, 1924) summarizes his findings as follows. Melanoma of the nail bed resembles paronychia, but is chronic and shows pigmentation. Occasional cases may occur without obvious pigmentation. The diagnosis is ordinarily made late with the result that treatment is hopeless. This condition must be considered in all chronic conditions of the nail bed. Diagnosis should be confirmed by excision and microscopic examination of tissue, followed by immediate operation

Significance of Blood Nitrogen in Cancer.—B. S. Barringer and R. Theis (*Surgery, Gynecology and Obstetrics,* October, 1924) assert from a number of cases of prostatic and bladder carcinoma that a high urea nitrogen definitely indicates that the kidneys may not stand the strain of operation.

Physical Diagnosis of Carcinoma in the Bronchus of the Upper Lobe.—Wilhelm Neumann (*Wiener klinische Wochenschrift,* May 1, 1924) states that percussion in the presence of carcinoma in the upper lobe bronchus reveals a normal apex with almost absolute dulness in the median half of the infraclavicular fossa down to the third rib and beyond the farther edge of the manubrium. Auscultation reveals absence of bronchial breathing, amphoric sounds or râles and diminution or absence of vesicular breathing. In this way a practically important differential diagnosis can be made in many cases.

Carcinoma of Prostate.—Gordon S. Foulds (*Canadian Practitioner,* November, 1924) arrives at the following conclusions: Carcinoma of the prostate occurs approximately once in every five cases of prostatic obstruction. Metastasis is common in carcinoma of the prostate. One third of the patients have metastasis when they consult a surgeon. Osseous metastasis occurs most frequently in the pelvic bones, spine and femurs. Roentgen ray examination of these parts should be made routinely in all cases before treatment is begun. Prostatectomy is indicated in early cases. Radium therapy is of value, but is only indicated in about half the patients presenting themselves with this disease. Thorough irradiation of all parts of the gland with moderate doses, applied throughout the whole gland, should be aimed at, rather than heavier irradiation less well distributed. Prolongation of life can be expected in only one fourth of the patients treated—though symptomatic relief may be expected in seventy-five per cent. of cases.

Operative Treatment in Cancer of the Uterine Cervix.—J. L. Faure (*Bulletin de l'Académie de médecine,* October 21, 1924) reports steadily improving results in abdominal hysterectomy for cancer of the cervix. Up to 1906 he had operated on twenty-five patients, eighteen of whom had survived the operation and twelve were traced and found living in 1906; at least two of these are still living. Later statistics dealt with eighty-three private cases, among which the operative mortality was 10.84 per cent. The percentage of lasting recoveries in this series was 52.12 per cent.; even among the thirty-six worst cases, lasting recoveries amounted to 27.58 per cent., while among the eighteen favorable, early cases they amounted to 88.23 per cent. The operative mortality was still high, however, being about twenty per cent. among hospital cases. In the last three years, realizing that this mortality was due almost entirely to infection, the writer has treated all cases as if they were severely infected, using Mikulicz drainage as a routine. This promptly reduced the mortality to two out of seventy-five cases, or less than three per cent. Extensive hysterectomy for cervical cancer can thus now be stated to be no more dangerous than simple hysterectomy for annexitis or fibroids. Radium, while of great service in inoperable cases, has yet to show such results in the operable cases as are now obtainable by operation.

Late Recurrence of Carcinoma of Breast.—G. Woolsey (*Annals of Surgery,* December, 1924) asserts that there is no time limit to the occurrence of recurrences. Recurrence is the rule and not the exception, but the ratio decreases in proportion to the time after operation. Irrespective of the time they appear after operation, local, regionary and metastatic growths are recurrences in the great majority of cases. Permeation of the fascial lymphatics accounts for most of the recurrences in the other breast and locally. The only way of lessening these is by early operation, wide removal of the deep fascia and postoperative radiation. Early radical operation, before the glands are involved, is still the best treatment, gives the best late results and avoids most cases of recurrence. The x ray, with or without operation, is the best treatment of recurrent cases and one of the best means of preventing postoperative recurrence.

The Relative Value of X Rays in Various Forms of Malignant Disease.—Francis Hernaman-Johnson (*Practitioner,* November, 1924) thus sums up his observations. Carcinoma is amenable to x ray treatment in the following order: breast, pelvis, stomach, esophagus, throat. Most sarcomata are readily affected, so far as the primary manifestations are concerned, but the expectation of life is not increased.

Both the divided dose and the intensive method have a legitimate place in treatment: the former for use in conjunction with surgery and as a prophylactic after operation; the latter in selected cases when surgical procedures have failed, or are not contemplated.

The results of intensive x ray treatment in severe, inoperable, or recurrent carcinoma of the breast or pelvis are often so brilliant that for some months, or even years, the patient may feel and appear normal. This temporary resurrection is in itself an end well worth seeking, and no wave of pessimism should be allowed to prevent patients from having the chance to attain it. Radiotherapy has made steady progress during the past few years.

A second intensive course occasionally repeats the good effects of the first, but a third rarely does so. The problem to be solved is how to make the benefits of successive courses cumulative. In so far as failure may be due to an immunity to x ray action possessed by later recurrences, the author believes we have at present no hint as to how to deal with the matter, but as regards maintaining in the patient himself the power to respond, we are in a better position. For we know that good surroundings, a diet rich in vitamines, and synthetic sunlight are capable of stimulating the body's resistance to disease; and they have not, so far, been used in any systematic way as aids in the fight against cancer.

Biological Aspects of the Radiation Therapy of Cancer.—Claude Regaud (*Canadian Practitioner,* September, 1924) says that there really exists, not only between different organs, between different tissues of the same organ, between different cell types of the same tissue, but also between the different physiological phases of the same cellular species, differences in radiosensitivity, and presents the following conclusions:

1. The radiation treatment of cancer must make use of the selective action of the rays in preference to their diffuse caustic effect.

2. The required selective action calls for more penetrating x rays, for increased voltages and higher potential tubes.

3. Radium therapy must employ ultrapenetrating gamma rays, filtered by heavy metals, as recommended by Dominici in 1907. The tube method is good, but not because it brings in the beta rays. It is inferior to the radium puncture method, with ultrapenetrating gamma rays. This last technic has the advantage of reducing the diffused caustic effect, the serious afterreactions, and radionecrosis.

4. The decreasing radiosusceptibility of the cancer cells treated by small, ineffective and successive doses, imposes the necessity of the single continuous or discontinuous treatment.

5. The chronological distribution of this single complete treatment must be adapted to the life peculiarities of the cancerous tissue.

Generally, the treatment is more effective if continuous and extended over six to ten days. This is particularly true for the epidermoid squamous cell cancers. The röntgenotherapy of cancer will also undoubtedly benefit in following as much as possible all these rules.

Radium in Prostatic Carcinoma.—B. S. Barringer (*Annals of Surgery,* December 1924) submits that the best method of treatment in our hands has been by radium needles inserted into the prostate and seminal vesicles, this repeated every two or three months until sclerosis of the carcinoma occurs. If there is urethral invasion, urethral treatment is added to the needle treatment. In from five to ten per cent. of cases, the carcinoma ought to be controlled by radium. Bone metastases occur in our cases in twenty-seven per cent. The diagnostic needle developed at the Memorial Hospital enables us to make an accurate diagnosis in a much larger percentage of early cases, and is used routinely in the diagnoses in question.

Simple and Malignant Tumors of the Breast.—Jane C. MacDonald (*Glasgow Medical Journal,* July, 1924) summarizes a long clinical and pathological study thus: The cases generally seen in hospital fall definitely into the three groups of mastitis, simple tumor, and malignancy. The malignant cases are sufficiently well developed when they present themselves to be easily diagnosed. In the early cases the doctor is not, as a rule, consulted, and only occasionally is he responsible for delay. There are practically no definite signs to indicate malignancy in its very early stages, and the plea for early recognition amounts to the careful examination, consideration, and interpretation of the individual case. The question of the education of the public as to the early recognition and treatment of cancer has its drawbacks, as the fear of malignancy in the mind of the patient or practitioner may lead to the unnecessary removal of a number of breasts. More conservative methods seem to be more in accordance with the pathological conditions.

Fibroid Tumors Complicating Pregnancy, Labor and the Puerperium.—Trevor B. Davies (*Clinical Journal,* July 16, 1924) says that the dangers of fibroids complicating pregnancy have been greatly exaggerated. The great majority of cases require no treatment. If the tumors become painful during pregnancy, rest, anodynes and mild aperients are indicated. Interference during pregnancy may be necessary under the following circumstances: Twisting of pedicle of subperitoneal fibroid; degenerative changes causing rapid enlargement of the tumor; extreme dypnea or distention of the abdomen, and severe hemorrhage. Myomectomy or hysterectomy will be required in these cases. The former is indicated if the fibroid is isolated, subperitoneal, or has a twisted pedicle. Hysterectomy is indicated if the fibroids are multiple or if the bleeding during a myomectomy cannot be controlled. Abortion often follows myomectomy. During labor careful watch and examination of the patient will enable one to determine whether a fibroid will obstruct delivery or not. If the obstruction does not become relieved by the tumor rising up into the abdomen, then operation is indicated as in the case described. Cæsarean section followed by total hysterectomy is the operation of choice. Total hysterectomy is just as easy as the subtotal in these cases, and in cases of doubtful asepsis is undoubtedly the better of the two. In the puerperium a polypus should be removed *per vaginam.* In infected subperitoneal or interstitial tumors total hysterectomy should be performed.

Carcinoma of the Breast.—B. J. Lee and N. W. Cornell (*Annals of Surgery,* September, 1924) present the following report of eighty-seven primary operable cases admitted to the New York Hospital prior to April 1, 1919.

1. Five year results in the treatment of mammary cancer are the shortest ones worthy of report.

2. The five year results in this series show fifteen per cent. of the patients alive and with no evidence of disease.

3. The term cured should be abolished and supplanted by "no evidence of disease to date."

4. Criteria of operability must be more sharply drawn.

5. The surgeon must learn to appreciate the physical and radiographic signs of early chest metastasis.

6. Metastasis to bones must be carefully excluded in every presumably primary operable case.

7. Continual followup of all postoperative cases is necessary if correct figures are to be obtained.

8. The term carcinoma of the breast probably includes a group of diseases differing in their pathology and their degree of malignancy.

9. Unusual pathological types should be collected in order that they may be separated out, the nonmalignant from the truly cancerous.

10. In cases with involvement of axillary nodes, radical amputation usually yields disappointing end results.

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Medicolegal Notes.

FACIAL SURGICAL OPERATION AS A "REASONABLE AND NECESSARY SERVICE OF A PHYSICIAN" UNDER THE CONNECTICUT STATUTE

In an action by a physician and surgeon against a husband and wife for the agreed on compensation for performing an operation on a scar on the husband's face, extending from the mouth to the ear, which operation greatly improved the patient's personal appearance, the question was raised whether the wife was liable under Connecticut Gen. Stat. 1918, §5275, providing that both husband and wife "shall be liable for the reasonable and necessary services of a physician rendered the husband, wife or their minor child."

Affirming a judgment for the plaintiff as against the husband and in favor of the wife, the Connecticut Supreme Court of Errors said, Ematrudo v. Gordon, 123 Att. 14, that the service rendered must be both reasonable and necessary. "In any given case it might well be that the station in life of the parties, their usual style of living, and their pecuniary position in general, being upon a liberal and generous scale, would justify charging the wife with the services of a most expert and expensive practitioner of plastic surgery to restore the husband's facial symmetry and comeliness; on the other hand, on account of facts of the same nature, but compelling a contracted mode of life and careful attention to pecuniary outgo, and considering the requirements of a less exacting social environment, it would be unreasonable and unjust to compel a wife, not by reason of her own contract, but as a burden cast on her by statute, to defray a charge such as that just suggested, or indeed any charge. To determine the question the trier would have to consider in the instant case what was the extent of the family income, the nature of the husband's employment, and whether it was steady or casual, whether or not the appearance of his face after the accident and prior to the operation, which interval the trial court states to have been a long time, had in fact operated adversely to the continuance or procurement of employment. There was also to be considered the extent to which both husband and wife contributed to the family support, the existence of any invested property, and in general the pecuniary situation of the parties and their social surroundings and general course of life. It is found by the court that there was no pain or suffering caused by the injury resulting in the scar.

"Assuming that the trial court had found facts showing that the station in life, style of living, and pecuniary situation of this family would have made this expenditure reasonable and necessary the conclusion of the trial court upon such a state of facts that these services were neither reasonable nor necessary would have been reviewable as a matter of law, and error must have been predicated thereon. But without these additional facts the conclusion of the trial judge must be tested as a matter of law upon the facts found, and upon these we must conclude that the trial judge was not in error in drawing the conclusion which he had drawn."

NEGLIGENCE IN FACIAL OPERATION

In an action in tort for malpractice in the performance of a surgical operation upon a thin lip, the California Supreme Court, Hall v. Steele, 226 Pac. 854, says: "In such cases whatever representations the physician, surgeon, or dermatologist may have made as an inducement to the performance of the operation are not essential to the plaintiff's alleged cause of action for negligence; the sole actionable issue being as to whether or not the operation was skillfully or unskillfully performed. In an ordinary action for malpractice the physician or surgeon is not to be held as a warrantor of cures or of consequences other than those arising from a breach of his duty to perform the operation skillfully, and if, as the individual cases show, through no unskillfulness on the part of the surgeon, the plaintiff's broken arm was permanently impaired (Houghton v. Dickson, 29 Cal. App. 321; McGraw v. Kerr, 23 Colo. App. 163), or the patient's nervous system shattered (Booth v. Andrus, 91 Neb. 810), or if the patient fails to recover (Wardemann v. Barnes, 92 Wis. 206) or even if, as in this case, the facial expression of the plaintiff is altered to an extent amounting to a disfiguration, the plaintiff cannot recover in this form of action without being able to show that the specific operation which the surgeon was engaged to perform was negligently and unskillfully performed."

The question whether these principles apply to naturopaths or "beauty doctors" did not arise in the case, the pleadings sounding in tort and being based on an alleged unskillful surgical operation. The court said a different issue involving this question would have been presented if the action had been one for the breach of warranty as to the result of the operation performed. Another question which was not discussed in counsels' briefs and which was therefore not decided by the court was as to the defenses which are available to a naturopath who undertakes to perform a surgical operation which his license as such naturopath does not entitle the holder to perform.

It was held that the expert evidence warranted the verdict of the jury that the operation performed was not the suitable one from a surgical point of view to accomplish the result desired and attempted, of narrowing the plaintiff's mouth, and judgment for plaintiff was affirmed.

REVOCATION OF LICENSE FOR CONVICTION OF CRIME INVOLVING MORAL TURPITUDE

The Georgia Supreme Court holds, Hughes v. State Board of Medical Examiners, 123 S. E. 879, that a court of equity will not enjoin the State Board of Medical Examiners from hearing a proceeding brought under section 14 of the act of August 20, 1918 (Acts 1918, p. 173), for the revocation of the license of a physician upon charges that he had been convicted of a crime involving moral turpitude and had caused the publication and circulation of an advertisement relative to diseases of the sexual organs, the grounds on which such injunction was sought being, first, that said section of said act was unconstitutional and void for certain designated reasons; second, that the provision making "conviction of crime involving moral turpitude," and the provision making "the publication and circulation of an advertisement relative to any disease of the sexual organs" are so vague, uncertain and definite as to render them void; third, that he had been granted a full pardon for the crime for which the revocation of his license was sought; and, fourth, that the defendants, unless restrained, would revoke his license and thus deprive him of the right to practise his profession, which was a valuable property right, as the plaintiff had adequate and complete remedies at law, by which, in the first instance, he could set up the alleged matters of defense before said board, and in the second instance, by an appeal from any judgment of said board, if adverse to him, to the superior court of the county of his residence, where all such matters of defense could be set up and determined. Such a proceeding was held to be quasi criminal in character, and within the general rule that a court of equity will not enjoin prosecutions for criminal offences or quasi criminal proceedings.

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Important Ophthalmic Signs in Diseases of the Nervous System

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One of the most important adjuncts to the diagnosis of diseases of the brain and central nervous system is through the medium of the eye, and for many years these ophthalmological manifestations have occupied a prominent place in medical science. Appreciating the immense importance of this vital subject, the ophthalmologist and the neurologist have devoted much time and study to it, that they might speak with some definite assurance on the subject.

If we but consider the close relation existing between the eye and the brain; the retina being an outgrowth from the rudimentary brain of the primary optic vesicle, and (1) the optic nerves being portions of the lobes of the brain, one may readily understand how the early manifestations of diseases of this organ may reveal themselves through the eye. The ophthalmologist is able, in many cases, upon examining the eye, to recognize pathological changes in their incipiency, and therefore make an intelligent diagnosis before the disease has progressed beyond the aid of medical or surgical intervention.

Assuming that the eye is a portion of the brain, then disease of this complex machine will, in many instances, reveal early changes in the visual organs by an alteration in the normal physiological functions, which manifest themselves by organic changes in the anatomical structure of the eye and visual pathway; or by functional derangement of its mechanism.

At this writing, I do not propose to go deeply into the study of any particular disease; the variegated symptomatology and diversity of syndromes would carry one far into other fields. I will, therefore, limit myself to the discussion of a few of the most common diseases of the nervous system, and attempt to give the eye signs encountered in each, with an outline for examination that I have found useful (2). This method of examination, if followed carefully, will enable one, upon correlation of the findings, to make a satisfactory diagnosis. Etiological and pathological changes that ensue, will not be discussed in detail, but merely touched upon when necessary. The following outline is of particular value:

1. Sensibility of the cornea.
2. Size, shape and reaction of the pupils.
3. Abnormalities of extraocular muscles; squint, nystagmus or paralysis.
4. Visual acuity, near and distant.
5. Visual fields.
6. Examination of fundi, noting condition of optic disc as regards atrophy, edema, or alterations in the bloodvessels.
7. Abnormalities, such as exophthalmos, ptosis of lids, inflammation, operations, or injuries.
8. To this list might be added convergence reaction, especially noting any possible paralysis of convergence or divergence.

Corneal sensibility is tested by gently touching the cornea with a piece of absorbent cotton twisted to a thread, noting the discomfort experienced by the patient and the rapidity with which he blinked; this test reveals any loss of function in the ophthalmic division of the fifth nerve. If winking reaction is slow or absent, we immediately think of the following:

a. Section of this branch.
b. Herpes zoster involving this branch.
c. The use of some drug in the eye, as cocaine.

If sensibility is diminished and unilateral, without facial hyperesthesia, it may mean tumor of the cerebellum on the same side. In this case, we should look for an accompanying nystagmus which is of the coarse type and to the same side, an unstable gait and a tendency to fall to the same side.

Hysteria.—This condition may cause hyperesthesia of one or both corneas, with accompanying sensory disturbances of other parts of the body, often with equal pupils and negative fundus findings.

Size and reaction of pupils.—Inequality of pupils is always pathological. Contraction of pupils takes place through the third nerve; dilatation through the sympathetic ciliospinal centre. The average pupil should measure about four mm. in diameter, allowing for old age, at which time the diameter is diminished.

When the pupil is dilated, one should consider mydriatics, myopia, excitement or emotion, irritation of the sympathetic nerves or paralysis of the third nerve. When the pupil is contracted, one thinks of myotics, irritation of third nerve or inhibition of the sympathetic. Normally, the pupil contracts to light, accommodation and convergence; however, disturbances in the motor portion of the reflex path of the third nerve may be exceptional. If such disturbance is in that portion of the reflex path which lies between the optic nerve (centripetal limb) and the third nerve (centrifugal limb), we find that the

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reaction of convergence and accommodation is maintained, while the reaction to light is absent (Argyll Robertson pupil, so often associated with tabes and progressive paresis). This has also been found in certain tumors located in the region of the third ventricle. By pressure, these growths may produce similar findings. Attention is called to the cases that show contraction of the pupil to light, but are not aware of the presence of light. To these belong the types that have lesions high up in the optic pathway above the connected fibres between the optic and the third nerve.

We encounter patients who show normal reaction to light and accommodation, but a complete paralysis of convergence, with all extraocular muscles functioning normally. Regarding the frequency of paralysis of convergence as an early manifestation of disease of the nervous system, I would like to say a few words. The causes are many (3): tabes, multiple sclerosis, in three per cent. of the cases and probably as a result of other organic nervous diseases. Paralysis of the power of convergence, partial or complete, without disturbance in lateral movements (5), is a form of nuclear palsy which is often found in disseminated sclerosis. I have found this condition associated with syphilis, migraine, and intestinal toxemia. In the two last mentioned conditions, the paralysis is usually of transitory nature. As to the localization of the lesion giving rise to this condition, many theories have been advanced, but few facts have been given to substantiate them. It is thought by many that disturbances in the region of Deiter's nucleus in the medulla oblongata may give rise to the aforesaid symptom. Bernheimer believes that the anatomical site of the lesion is probably in the fibres connecting the nondecussating fasciculi of the two internal recti nuclei with each other, or connecting these fasciculi with the cortex. Edinger's views, as contained in the seventh edition of his lectures upon the *Structure of the Nervous System*, are that the centre of convergence may be formed by the large cell median nucleus of the ocular motor nerve, associated with the nerve cells for the rectus internus which lie on either side and near the median nucleus, and that these three groups together may form a centre for convergence; while Marina's investigations (6) have made it seem doubtful that such a centre in the oculomotor nucleus really exists. The majority of us, however, will admit the existence of such a centre, wherever it may be.

I have found six cases showing this condition: two acknowledged syphilis and had four plus Wassermanns, and two were suffering from gastrointestinal toxemia with negative Wassermanns. The fifth had a negative general and family history, and no cause for the condition could be determined. In the sixth patient there suddenly developed a dilated pupil on the left side, with loss of reaction to light and accommodation, and an accompanying convergence paralysis. The Wassermann reaction was doubtful.

The examination of the ocular muscles is of great importance in the early diagnosis of diseases of the central nervous system. It is well to notice the position of the eyes in the primary field, and have the patient perform the associated movement tests in the six cardinal positions. If diplopia is found, the tangent screen, with a red glass in front of one eye, readily enables one to locate the muscle or muscles involved, and in this way, phorias, trophias and paralytic deviations may be differentiated. One or more ocular muscles may be involved very early, and frequently diplopia is one of the first symptoms complained of, and may be a forerunner of a grave disease of the brain. This is especially true in lethargic encephalitis. In this condition, the prodromal symptoms are usually diplopia, perhaps associated with a headache or general bodily weakness. Upon examination, there is often found paresis or a true paralysis of one or more of the ocular muscles, and an associated sluggishness of accommodation.

I do not recall having ever seen a case of this disease, in which, at one time or another, the patient did not have symptoms of diplopia. In the ocular muscle palsies, the site of the lesion is, as a rule, in the nucleus of the supplying nerve or its trunk, and of all the muscles of the eye, the external recti are the most frequently involved, chiefly because of the long basilar course of the sixth nerve. Next in order come the muscles supplied by the third or oculomotor nerve, and lastly, the superior oblique muscle, which is innervated by the fourth nerve.

In cases of intracranial pressure, the external rectus is frequently involved, but this is of little value in localizing the site of the lesion. The cause of this early and frequent involvement is thought to be due to compression of the nerve trunk by a cerebellar artery (Cushing).

In lesions involving the nucleus of the third nerve, we may have, as a resulting condition, ophthalmoplegia externa, interna, or totalis. In the former case, the sphincter muscle and the muscle of accommodation are not involved. We often encounter isolated paralyses of the muscles supplied by the oculomotor nerve and which are not of nuclear origin. The reason for this may be explained by the fact that the fibres forming the third nerve are not closely united at the point of exit of the nerve from the cerebral peduncle. And it is because of this that paralysis of one or more of the muscles innervated by the third nerve may be encountered in basilar meningitis without paralysis of the whole muscular supply of this nerve. Paralysis of the superior oblique is rare but when found it usually is of basilar origin. However, it has been found in relation to tumors in the pineal gland (7).

When conjugate deviations are noted, we may readily assume that the lesion is central. The causes of this condition are many: apoplexy, epilepsy, certain tumors of the brain, and other conditions.

It is hardly necessary to discuss the value of testing the visual acuity, for we all realize the importance of having any refractive error corrected so that we may be sure the reduction of vision is not due to this. A routine examination of the fundus, and preferably under a mydriatic, often gives us the true picture of the changes with which we are confronted, and shows us what to expect. In many cases it enables us to make an accurate diagnosis, to give the neurologist information which helps him to localize the causative lesion, and enables us to form an opinion as to the necessity for surgical intervention and to furnish a fair prognosis as to the probability of blindness.

Perimetry is of untold value; therefore, a careful perimetric test should be made in every case and an accurate record of one's findings kept. By so doing, we can check up findings formerly made and so map out islands of blindness, and accurately determine the extent of involvement. We are able, by this method, also to make a differential diagnosis in many cases and frequently, before visible changes in the nerve head are perceived with the ophthalmoscope, are further able to make a fairly accurate localization of the lesion with the perimeter, and to differentiate the organic from the functional.

Before reporting several cases, I should like to discuss, briefly, the condition that is commonly termed migraine, or scintillating scotoma. This condition which may be defined as a neurosis characterized by paroxysmal attacks of headache, preceded by visual disturbances bizarre in character, is thought by many to be of hereditary origin and closely to resemble epilepsy, and to be caused by a disturbance in the circulation of the blood in the bloodvessels of the brain, probably an angioneurosis of the vessels in the calcarine cortex. However, I am not prepared to say whether the condition is hereditary or allied to epilepsy.

It has been my experience to find that these cases have, as a contributory cause, eyestrain produced by small refractive errors, frequently astigmatism against the rule, or one or the other cylinder off axis. In other cases, I have found a history of gastrointestinal toxemia with constipation.

In no way am I trying to discredit, or attempting to disprove any statements made by well known authorities who have gone much further and deeper into the question of the etiological factors underlying this condition; I am speaking only from personal observations.

Associated with visual disturbances, I have found one case that presented distinct paralysis of convergence which was transitory in character. The patient, on the subsiding of the attack, was found to have binocular single vision, thus showing that, whatever the etiological factor might have been, the visual centres were in some way affected, as well as the centre of convergence.

While taking the visual field of another patient during an attack, and making a fundus examination, I found he was not only apathetic, but that he frequently called objects by the wrong name (psychical migraine). This condition has been described in detail by Liveing (8) and Oppenheim (9). The only way in which I could account for these symptoms was by the extension of the angioneurosis to other areas of the brain. When taking the fields at different intervals, of two patients, the frequency of left homonymous hemianopsia was noted, and I thought I had made a discovery. A few days later, one of these patients had another attack and when taking the fields, I was surprised to find a right homonymous hemianopsia.

The onset of these attacks is described beautifully in many cases, beginning with zig zag lines and many colored lights, to a blurring of portions of objects. The latter is the most common type, the blurring gradually progressing to the point of blotting out definite areas of the fields and, at times, taking the form of homonymous hemianopsia, more intense on one side than the other. As the attack progresses, there is a contraction in the corresponding fields. Such an attack, as a rule, does not last longer than thirty or forty minutes and with the wearing off of the visual disturbance, the headache follows.

With the subsiding of these visual disturbances, I have seen the paralysis of convergence remain for forty-eight hours, and at the expiration of this time, the patient have orthophoria with perfect fusion of images.

Case I.—Migraine associated with astigmatism against the rule, convergence insufficiency and history of gastrointestinal toxemia. J. R., aged twenty-nine, white, male. Complaint—attacks of headache and blurred vision, associated with dancing lights in front of eyes. These attacks came on, as a rule, after the patient had been reading or studying. The family history was negative. Previous history showed the usual diseases of childhood. The venereal history was negative. The patient used tobacco moderately; had a good appetite, and slept well. Suffered from intestinal stasis and indigestion. Examination of eyes—vision 20/20 O.U., fundi and media normal and clear; examination of extraocular muscles showed twelve degrees of exophoria for near with a remote near point; retinoscopy showed O.D.+0.25 sph.+0.500 axis 180. With this correction, patient read 20/15; examination of visual fields, the first field, which was taken August 1, 1920, and about twenty minutes after the attack of blurred vision had started, showed left homonymous hemianopsia with a restriction in the corresponding halves in both fields. As the attack progressed, the entire fields of both eyes were contracted down to within thirty degree limits, after which there was found to be a sudden cessation of the blurring experience, and the fields cleared rapidly.

Two months later (October 5th), thirty minutes after the attack of blurred vision, the visual fields showed right homonymous hemianopsia, with restriction of the corresponding fields. The fields taken between the attacks were found to be normal, and no enlargement of blind spots noted. The patient's refractive error was corrected and he was advised to wear his glasses constantly. Convergence exercises were started and careful attention to the diet and gastrointestinal tract was advised, with the result that the attacks that previously occurred at frequent intervals have not occurred in a period of several months. Concluding, I will say that this, to my mind, was a case of migraine, due largely to a refractive error associated with an ocular muscle insufficiency, intensified by gastrointestinal disturbances.

Case II.—Paralysis of convergence, probably of syphilitic origin. E. H., aged forty-one, colored, male. Complaint—double vision. Past history of rheumatism. Venereal disease was denied. Present trouble started three years ago, following an attack of rheumatism. Patient began to see double at that time and condition has since grown worse. Examination reveals vision O.D. 20/100, O.S. 20/70 corrected to O.D. 20/20 with a+0.50 sph.+0.75 C ax vertical. O.S. 20/20 with a+0.70 sph.+0.50 sph. ax vertical. Fundi and media normal. Pupillary reactions normal to light and accommodation. Near point of accommodation 22½ cms. O.U. Extraocu-

lar muscle movements normal in all fields. Exotropia 14 degrees for near, 1½ degrees for distance. Tangent screen shows crossed diplopia in primary fields, not increasing in other fields. Patient unable to converge to the slightest degree. Neurological examination negative, except some inequality of knee jerks. X ray of skull and paranasal sinuses negative. Blood Wassermann positive. This was a case of convergence paralysis and, in my opinion, due to syphilis. Patient was put on mixed treatment and intravenous injections of salvarsan. His condition improved.

Case III.—H. J., aged twenty-two, colored, male. Complaint—double vision. Family history negative. Present history negative. Venereal history denied. Present trouble dated back seven years, when patient suddenly noticed that objects appeared double. Condition had progressed slowly. Examination revealed vision 20/20 O.U. Fundi and media clear. Pupils reacted to light and accommodation. Near point of accommodation 12 cms. O.U. Near point of convergence 225 cms. Extraocular muscles examination showed 7½ degrees of exotropia for near. Orthophoria for distance. Associated movements were test normal in all positions. No individual muscle paralysis. Tangent screen showed crossed diplopia in primary field, remaining the same in all other fields. Neurological report negative. X ray of skull failed to reveal any pathological findings. Paranasal sinuses negative. Blood Wassermann positive. Patient was on intravenous salvarsan and mixed treatment, and his condition had, to date, remained stationary, with no improvement of ocular symptoms.

Case IV.—S. A., colored, female, aged forty-six. There suddenly developed dilated pupil on the left side, with inability to fuse objects. Past history of no consequence. Venereal history denied. Examination of fundi and media clear and normal. Right pupil reacted to light and accommodation, and normal in size. Left eye showed complete internal ophthalmoplegia, with a fixed pupil that did not react to light and accommodation. Consensual reflex from right to left absent, from left to right present. Examination of extraocular muscles showed no individual muscle paralysis. Crossed diplopia in primary field and not increased in any other field. Near point of convergence 150 cms. Blood Wassermann questionable.

This, I think, should be looked upon as convergence paralysis associated with an ophthalmoplegia interna, and tends to substantiate the teachings of Edinger in locating the centre of convergence in close proximity to the nucleus of the oculomotor nerve. As to the doubtful Wassermann, I am skeptical. However, the left pupil returned to normal size in less than two weeks under intensive treatment with mercury and iodides.

A routine examination, similar or as outlined, should be adhered to in the examination of every patient. By so doing, an insight may be gained, in many cases, as to the condition of the central nervous system.

Every patient complaining of headache, especially of migrainous type, should be refracted and the diet regulated and watched, as this condition is frequently due to an astigmatic error or some disturbance in the gastrointestinal tract. In the examination of the ocular muscles, it is well to bear in mind the importance of convergence paralysis, as it is a symptom more common than is generally believed, and frequently of syphilitic origin.

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The Diagnosis of Acute Conditions of the Brain

With Special Study of the Spinal Fluid and Reference to the Child

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In the case of socalled brain symptoms suddenly appearing in a person up to then well, or at the moment suffering from some other condition, one will think of encephalitis or meningitis, or, if trauma has been encountered, of fracture of the skull, concussion, contusion, edema, hemorrhage, encephalitis, meningitis, or combinations of these, pachymeningitis (after trauma, chronic alcoholism, or in hemorrhagic diatheses), or, again, shock, psychosis or psychoneurosis. Brain symptoms of systemic conditions—nephritis, eclampsia, diabetes, etc.—must also be thought of, apoplexy (from arterial disease and hemorrhagic tendencies) (I), embolism (from a rheumatic heart, or, in the course of diphtheria, scarlet, typhoid, pneumonia, erythema nodosum or septic process) and thrombosis (luetic, typhoid, carbon dioxide poisoning), while one will have to make special survey from the angle of otitis, parasites getting into the head, and, finally, endogenous and exogenous toxins, drug and chemical poisoning.

Where long bones have been fractured or broken, a fat embolus may give cerebral symptoms. Such embolism seems to be rare after operation, yet it might be thought of. Thus, I saw a central facial, after an appendectomy, which could possibly be interpreted in this way (and there seemed no other interpretation).

In some cases, the lumbar puncture achieves the

diagnosis, the liquor findings being characteristic, or even pathognomonic; in others, it clinches an opinion clinically attained, while in still others, it serves but negatively, or even, at times, confuses the issues. It is necessary, therefore, to bear the diagnostic possibilities in mind, and collate the clinical data with the liquor findings and laboratory norms.

Among the encephalitides, we have a primary group: Heine-Medin, influenzal, epidemic (Economo), and a type which might be labeled "without evident or known etiology," this last being of two forms: a, with definite hemorrhagic encephalitis lesions, and, b, without discoverable lesion, i. e., without anatomical basis,—and a secondary group: consequent to the infectious diseases, to the exanthemata, to toxemia, autotoxemia and intoxications (food, ptomaine, various drug poisons), and to trauma. (For details, cf. 1.) The possibility of a syphilotoxic encephalitis on the basis of lues has also been brought up (Oppenheim). The unusual primary forms of sunstroke and heat stroke (1), and an unusual secondary, due to dysentery (2), may be mentioned.

Among the meningitides, we again have several primary forms: epidemic, tuberculous (II), possibly influenzal (though this is unusual), and possibly a primary serous form (very unusual), and, rarely, a serous meningitis as an expression of Heine-Medin disease—and the secondary: tuberculous, pneumococcal, staphylococcal and streptococcal, influenzal, diphtheritic (III), gonococcal, syphilitic, enteritic, etc., and the "sympathetic" (aseptic purulent) and serous (IV) forms.

One will also think of a pachymeningitis hemorrhagica interna, or a hematoma of the dura, after trauma, and especially after trauma in a chronic alcoholic or an arteriosclerotic, the first coming at times spontaneously in the alcoholic or where a hemorrhagic tendency exists.

Syphilis usually causes a chronic condition, i. e., a meningoencephalitis, yet it can (rarely) produce an acute febrile meningitis (Pette's study (7), out of Nonne's clinic). Oppenheim also thought that a nongummatous simple meningitis could occur. Besides, we must reckon with acute exacerbations and flareups, and possibly even with an acute gummatous form. Of this subject of syphilis, however, more will be said below.

Acute brain symptoms similar to apoplexy (or sometimes to epilepsy) are also encountered in paresis, multiple sclerosis, brain swelling and socalled "sudden tumor." (For differential details in these latter forms, cf. 8.)

The normal spinal fluid (9) is clear, has a specific gravity of 1005-1010, a pressure of about 90 to 120 or 130 mm. of water, contains only a few cells (lymphocytes) to the cmm., three or four, at most, five or six. It contains but minute quantities of albumin —0.02 or 0.03 to 0.05 per cent—and globulin. The sugar content is about 0.06 to 0.09 per cent (10). The Wassermann, whether with 0.02 or 1.10 c. c. of fluid, is, normally, negative. Where the fluid is turbid, this is due to the presence of white cells (pleocytosis)—[pus]—and signifies irritation or inflammation of the meninges. Where bloody, the color may be due to injury to subdural veins in making the spinal puncture. This bleeding, however, rapidly stops, and the following portions of the fluid are clear. Where the blood is due to abnormal spinal fluid (bleeding from brain, cord or meninges), it continues to flow out red (sometimes yellowish), and, after standing, does not coagulate (as does the former). A moderate pleocytosis occurs after lumbar puncture, also on the injection of serum or drugs into the dural sac, and through (neighborhood) irritation of suppurative process in the ear or mastoid. In diabetic coma, the spinal fluid contains acetone.

As a routine procedure, I would suggest the following: Note the blood pressure. High readings will at once suggest systemic conditions (nephropathies, eclampsia, uremia, etc.) (the uranalysis may give corroborative data (5), or may point to heightened intracranial pressure. Take blood for a Wassermann (it is wise to make this in every case—even when syphilis doesn't seem possible), differential white cell count (a high leucocytosis suggesting suppuration somewhere in the body, or, in cases of head injury, a moderate leucocytosis pointing to fracture of the skull (12)) and smears (bacteria). In some cases (tuberculosis or suspected tuberculosis), the corpuscle sinking time (sedimentation test) may add valuable data (VI):

Blood pressure
Uranalysis
White cell count
B.W., i.e., Blood Wassermann
Sedimentation test
(Mátéfy)

Then proceed with the liquor examination proper, i. e.:

Spinal fluid pressure (VII)
Appearance (macroscopic)
Cell count
Presence of bacteria
Phase I (Nonne-Apelt)
Albumin content
Sugar (glucose: Fehling's reduction)
L.W., i.e., Liquor Wassermann
Meinicke (3rd modification)
Pandy
Mastix and colloidal gold reactions

The particular tests will be discussed as they come up under the various conditions and diseases here studied. Several facts, however, may advantageously be brought out before proceeding.

Albumin as such is found in the spinal fluid in all inflammatory conditions of the meninges, but also in syphilis (including tabes and paresis), tumors of brain and spine. One will find it in chronic meningeal (or cortical?) irritation, kept active by cysts and softenings, manifesting itself through epileptic seizures (14).

The *globulin* content in the spinal fluid is practically nil in normal individuals. A positive globulin test (Nonne's Phase I, or Pandy) means organic disease of the central nervous system, but not necessarily syphilis. It never is found in an individual with an organically sound brain and spine, nor in cases of functional nervous disease (15). Nonne comments that no Phase I is ever found in the neurasthenic, hysterical or epileptic who once was syphilitic (but who has no syphilis now). It thus decides between the neurasthenia of early paresis and the neurasthenia of an individual who once was syphilitic—but now only has neurasthenia. In other words, it is present in both syphilitic and "metasyphilitic" disease (VIII). It cannot differentiate between syphilitic and nonsyphilitic organic disease of the nervous system. According to Beltz (17),

it is present in inflammatory conditions of the meninges, both tuberculous and suppurative, and also (but weak) in meningeal irritation in pneumonia and acute leucemia, and after an epileptic attack. These facts, of course, do not apply to albumin as such which may be found in both organic and many functional nervous diseases. There are times when the globulin test shows up in syphilis (sometimes with pleocytosis, sometimes without) even before the Wassermann (18). It is sometimes absent, however, in lues cerebri, especially the arterial form.

A blood Wassermann means that the patient once had, or still has, syphilis (i. e., has some spirochetes somewhere in him, or spirochete products—Nonne), but not that the presenting disease is necessarily syphilitic. (Occasionally it is met with in recent scarlet, malaria, leprosy, recurrens and possibly multiple sclerosis. Occasionally it is absent, in spite of obtaining cerebral syphilis. In tabes, it is absent in thirty to forty per cent of cases—though they are syphilitic.)

The spinal fluid findings may refer to the said lues, and need not be evidence of the presenting disease. Absent *liquor Wassermann* by no means precludes syphilis. The reaction is often negative in cerebrospinal syphilis, rarely also in paresis. According to Nonne, an isolated weak liquor Wassermann need not even be positive for nerve lues. If a nervous disease is present, and the liquor Wassermann is positive, then the disease is probably syphilitic.

HEINE-MEDIN DISEASE.

Of the encephalitides, let us first review the Heine-Medin form:

Heine-Medin disease usually besets a previously entirely healthy child, occasionally with prodromata, more often without. (In the great Swedish epidemic, they were rare, though Brorström (19) mentions stiffness and spasms occasionally preceding the paralyses). One has spoken of this prodromata stage as the *preparalytic stage*. There is, however, nothing whatsoever characteristic about this infection. The onset may be sudden, peracute or gradual and protracted. A number show a "forestage—remission—recidive" progression. This has sometimes been termed the dromedary type of case. It may run its entire course in two or three days, or a week, or over a longer period. The temperature may be high, low or absent.

The onset is like that of any infectious disease: temperature, headache, vomiting, frequently loose bowels. Very rarely there is a convulsion. Often, pain is present "all over," or especially in the head, neck, back and stomach. Eruptions of various types may be seen—or may be absent. If in the midst of an epidemic, and this is all there is of the sickness, one will say abortive poliomyelitis. If not in an epidemic, one will say grippe or gastrointestinal attack, or, sometimes, sore throat. Or, again, rarely, a grave condition may ensue, with convulsions or coma—the picture being undifferentiable from tuberculous or epidemic meningitis. In some abortive cases, merely the patellar reflex may be absent, or there is a passing meningeal phase.

Then comes the *paralytic stage:* after a day or two, or three, something is added to the above—paralyses. This gives the diagnosis (though spinal puncture may already have intimated it). The paralyses come rapidly, and are in full effect from the start (differing thus from polyneuritis). In most cases, the paralyses are flaccid, and in the extremities, with loss of tendon reflexes; in many cases, they involve the cranial nerves; in a rare few, they are spastic, and indicate cerebral mischief.

There is intense sweating, great hyperesthesia and nuchal pain on extending the head. There may be stiffness and pain in the back. Trembling and twitching may be noticed, drowsiness, retention of urine.

Blood and lumbar punctate show the following—and the findings here hold good for conditions in which cortical (encephalitic) involvement is not present, but merely disease of the brain stem, or, indeed, of the spinal form itself, as all forms show a meningitic irritation (reaction):

A blood leucocytosis polymorphonucleosis (20).
Pressure of liquor usually increased.
Usually clear (there may be a slight opalescence).
Cells increased (pleocytosis: preponderantly mononuclears) (15 to 20-1000 or over; 450 average [but lower averages have also been given, i.e., 20 to 100]).
No bacteria are found.
Albumin is increased.
Globulin increased (slight, moderate, more often, marked).
Glucose (Fehling's always well reduced [but Fehling's is reduced by most other spinal fluids, too]).
(A web or fibrous net is occasionally seen after standing.)
Colloidal gold curve corresponds to that of a weak syphilitic spinal fluid (IX).

These are the usual typical findings. But many findings are atypical: thus, one will come upon cases in which the polymorphonuclear cells are increased, some showing over fifty per cent. of these cells (23). In only thirty-nine out of fifteen hundred fluids of the New York Health Department did polymorphonuclears predominate. Such fluids are turbid, and then must be differentiated from other turbid spinal fluids, namely, early purulent meningitis (in which case the cells show ninety per cent or more polymorphonuclears, and the specific bacteria are found) and tuberculous meningitis. (There are, however, some cases of epidemic and tuberculous meningitis in which the respective organisms are not discovered). Where the fluid is clear, one will have to differentiate Heine-Medin disease from tuberculous meningitis (X) (the clinical course is most dissimilar, l. c.), unusual early cases of purulent meningitis, syphilis of the central nervous system (XI) (especially acute syphilitic meningitis) and serous meningitis.

This last may cause difficulty, because there is a form of Heine-Medin disease spoken of as the meningeal (or meningitic) form. During the last epidemic, Netter, of Paris, called attention to the fact that this form was especially prevalent in France. He found the clinical picture very similar to that of cerebrospinal meningitis. Both these diseases seem to occur epidemically at the same time. Here, a serous meningitis obtains, with high pressure, pleocytosis, positive Nonne-Apelt, possibly a web in the liquor. Clinically, one finds retraction and stiffness of the neck and nuchal pain, occasionally slight opisthotonus. The diagnosis of meningitis may be made—until typical Heine-Medin paralyses appear. But Wickman (24) also pointed out that Heine-Medin disease may occur as a meningitis serosa, without the appearance of any paralyses. Such cases he believed could

no doubt be found among those misdiagnosed as meningismé. Sporadic cases seem rare, yet do occur, as the following case shows, and must be diagnosed by exclusion:

Case I—I recently saw a case with Dr. R. A child of ten, presumably healthy, became restless during the night, screaming out several times; complained of headache. On the following day, there was pain in the legs, and a temperature of 102°. There had been no vomiting or chill, and no drowsiness. The child, in fact, was remarkably alert throughout his entire illness. The following day, on examining the child, I found difficulty in flexing the head, an attempt causing considerable nuchal pain, and slight stiffness in this region. Kernig on the left leg; weakness on the right. After three days, the child was entirely well.

Two rare types of fluid have been described (J. B. Neal, report of New York Department of Health, l. c.), one a hemorrhagic form, the blood cells being diffused throughout the spinal fluid. These are cases in which the hemorrhagic process has been unusually severe. The second is a yellowish fluid (syndrome of Froin), where the hemorrhage has occurred several days previously.

The spinal fluid may also be blood tinged, through injury of a vessel in the canal, in making the puncture.

EPIDEMIC ENCEPHALITIS.

Epidemic (lethargic) encephalitis may begin suddenly, usually without prodromata. In a variously estimated, yet very considerable, percentage of cases, influenza has preceded a week to several weeks or more (occasionally a year (XII)). Or a fevery stage may precede, with grippal symptoms, after which, the disease proper, evidencing eye signs and somnolence, sets in. The onset may be with general malaise, fatigue or weakness, dizziness, possibly pains here and there—occasionally severe—(joints, back, nape, mastoid region), moderate headache (rarely intense, as in meningitis) and some nausea and vomiting—which usually does not last long. Temperature may or may not be present, and, save in bad cases, is never high (XIII). An initial chill does not seem to occur, or but unusually. Mild meningeal symptoms (more properly speaking, intimations of such), on the other hand, are often noted: sensitiveness of the bulbi to pressure, a very slight tendency to nuchal rigidity and nuchal tenderness. Rarely Kernig's sign is present. Some observers noticed this meningeal reaction more than others, some but rarely (Nonne (28)); Economo, on the other hand, terming it meningismus, believed it typical and common. Thus, the following may be taken as a somewhat characteristic onset:

Case II—Patient N. N., early in December, is said to have had grippe. In bed several days with cough, malaise, headache, "all in." After a few days, recovered. Four weeks ago, patient, on rising, felt things swim about her, and had some ear ringing. Soon she noticed she saw double, felt fatigued, with overwhelming desire to sleep. She slept all day and all night, had to be awakened to eat. She fell asleep while eating. Then she noticed she did not see well, things appeared dim and unclear (accommodation disturbance). Severe constipation obtained. When she attempted to walk, she swayed.

Economo's first case or two may also here be cited (they will have historic interest):

Case III.—M. H., thirty-one years old. Taken sick suddenly with chilly feeling, headache and clouded sensorium. Since then, is "lost," apathetic, takes no food. In the eight days prior to hospitalization, had a staggering gait. Brought in three weeks after onset, supported by two persons. Sensorium lightly clouded, mild bilateral ptosis and bilateral external oculomotor paralysis. Pupils react. On the right side, exaggeration of reflexes in lower extremity.—Patient sleeps all day; frequent yawning. Reacts to very loud questioning slowly and sparely, etc.

Case IV—R. H., seventeen years old. Acute onset February 3rd with temperature 39.5°, confusion, headache in occiput and nape. Stiffness of the arms and legs. Patient was somnolent from the start, held her eyes closed, but talked incessantly "irrational stuff." February 5th in hospital. Temperature, 39.2°. No spontaneous movements, lies on back, asleep. Light rigidity of extremities, but no abnormal reflexes. Sensorium clouded, yet is arousable on questioning, and answers rationally—is oriented. Keeps eyes closed. Pupils react. Possibly left abducens paresis, etc.

Unique is the fact pointed out by Strümpell (29) that the patient can nearly always tell the very day, often the very hour, his illness began. This acute definiteness of onset, however, though the rule, may at times prove but subacute, or even a gradual affair, yet, again, on the other hand, be quite fulminant. The disease has, in fact, come on so apoplectiform like as to necessitate differentiation from real apoplexy (XIV).

The spinal fluid in epidemic encephalitis (31) is in no wise characteristic. It may be normal, as in Nonne's [l. c. (28)] and Umber's (32) series, or somewhat abnormal. One might sum up as follows:

Normal or slightly increased pressure, occasionally high.

Occasionally very high. Some of these cases also showed optic disc changes, and gave a picture very similar to brain tumor (cf. case of Winter's (37).

Clear occasionally: rarely blood tinged or yellow greenish tinge.

The cell count shows a mild pleocytosis. This may, at times, be very low (rarely 6 to 9 to the cmm.), occasionally 100 and over (in a few cases, 400 to 500). (Economo found 10 to 20; Plaut, 40 to 60; Barker, 10 to 100; Bonhoeffer, and also Forster (38), a "strong lymphocytosis" in all.) Polynuclear cells are present, and proportionately high in some series (XV) (Economo's).

No organisms found.

Nonne-Apelt negative or weak positive.

The complete albumin is increased (with Nissl test, between 0.5 and 5.5%, according to Economo).

Slight coagulate (fibre) in occasional cases.

Globulin sometimes normal, sometimes excessive (greatly increased in some series—Barker, Neal).

Fehling reduction, normal or increased (XVI).

Colloidal gold test not characteristic.

INFLUENZA.

As there may be confusion at times as to whether one is dealing with influenza proper or epidemic encephalitis, it might be well to point out that in influenza, even where severe, and with cerebral manifestations, namely, with outspoken psychotic disturbances, the spinal fluid shows nothing abnormal (45). A hemorrhagic encephalitis may, however, occur (cf. 1 for differential study on influenzal encephalitis vs. epidemic encephalitis).

From the clinical angle, Leichtenstern (46) came to somewhat the same conclusions. He pointed out that the onset of influenza is almost without exception a sudden one—hence the name lightning catarrh given to it in 1782. At the very beginning—i. e., without prodromata—or when at its height, under soaring temperature, apoplectiform, hemi- or monoplegic paralyses may appear, with accompaniments of delirium, coma, etc. Elsewhere Leichtenstern notes that the disease may begin with a sudden vertiginous siege or obfuscation of the senses, or an "apoplectic" or epileptic attack, accompanied by unconsciousness of several hours' duration. (The quotation marks about apoplectic are his own). Such a case not infrequently clears up after a few days. In children, even if but seldom it happens that a deep faint or convulsion, or a convulsive seizure, with subsequent long continued unconsciousness, may initiate the attack. Or, again, a sudden terrible vertigo may come, followed by sopor or unconsciousness. Such an attack may also be followed by mild influenza symptoms, and rapidly clear up. In one case, there was no temperature with the apoplexy but the next day, high fever and grippal symptoms. After three days, the patient was quite well again. He also mentions the important fact that the picture at first may be that of an acute psychosis (initial delirium or stupor, fear, delusions, confusion, mania), and, in fact, without any temperature at the time. These cases are often diagnosed as acute psychoses—only in a few days suddenly to clear up. He attributes these severe initial attacks to acute poisoning through the influenzal toxine acting through the circulation with unusual intensity, and primarily on the brain—not to encephalitis. An influenzal encephalitis, however, occurs, with a tendency to minute (flea bite) and larger hemorrhages, with paralysis of an entire side, or limb, or an isolated cranial nerve (XVII), or aphasia. All these symptoms may clear up within a day or two.

An influenzal meningitis also occurs, though not frequently. Nor is the condition dealt with (bacteriologically) entirely clear. In the 1918 epidemic, various etiological organisms were found (pneumococcus, streptococcus, etc.), but not the Pfeiffer (47, 48). However, a Pfeiffer meningitis does occur, giving a purulent spinal fluid containing the Pfeiffer organism. The cases are not common (XVIII).

T. M. Rivers (50) suggested the indol test on the spinal fluid for rapid diagnosis of bacillus meningeal infections. He found this of diagnostic value.

Retinal bleeding (51) and flea bite petechiæ in the tympanic membrane will point to influenza.

(To be continued.)

The Correct Conception of Thoracic Empyema and Its Rational Physiological Treatment

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The method of treatment to be presented in this paper was originated the latter part of the war (1918-1919) during the epidemic of influenza and has been used since by several surgeons and by myself. More than one hundred and fifty cases have been treated by this method, the age of the patients ranging from six months to fifty-eight years. While not presenting statistics, which would have to be incomplete and therefore valueless, we may state that in the thirty or more cases treated in this country by Honan, Kellogg, Lewson, Lutton, at the Flower Hospital, by Scannell and Smith at the Greenpoint Hospital, and by me at the same institutions and at the Sea View Hospital, the average hospitalization time was sixteen days with no mortality.

The method is based on these physiologically, mechanically, clinically and psychologically rational principles: it takes into consideration the defensive rôle of the pus; it preserves the negative pressure of the chest, compelling the retracted lung to expand gradually, continuously, while the pus is automatically drained out as fast as it forms. It does not require rib resection. It allows a maximum comfort to the patient, being painless and not requiring any painful or even annoying manipulation, such as change of dressing, irrigations, aspirations and allowing the patient out of bed immediately or a few days after the operation. Clinical experience has shown that the method is exceedingly simple in its application once its basic principles are understood. Any general practitioner possessing enough surgical sense, training and skill to do good minor surgery can apply the method under all circumstances. The method is most economical because it shortens the time of treatment, does not require expensive dressings, apparatus or special expensive attendants. It prevents, practically in all cases, the complications so commonly observed in cases of empyema too numerous and well known to be even mentioned.

RATIONAL CONCEPTION OF THORACIC EMPYEMA

A clear and rational understanding of what empyema thoracis represents is indispensable to its rational treatment. The following few considerations, although elementary, seem necessary in order to make the problem clear. Negative pressure in the thorax allows the easy and alternate expansion and contraction of the lungs. The pleura lines two completely closed cavities surrounded by bony and muscular structures, practically unyielding, and contains two expansive, elastic and easily collapsible organs—the lungs, separated by the mediastinum. The pleura in normal physiological conditions allows the lungs a free expansion without friction, and contains for this purpose a small amount of fluid. The amount and function of this fluid can be compared to the amount and function of the lubricant found between the cylinders and the pistons in motors and

its amount is regulated by a well balanced production and absorption.

In certain pathological conditions the amount of the fluid found between the visceral and parietal pleurae increases. Some organs must obviously be dislodged by the fluid which, according to physical laws, cannot be compressed and which accumulates in the pleural cavity. Evidently, the lung corresponding to the pleural cavity in which the fluid accumulates will therefore be first dislodged and compressed.

What follows the compression of the lung? A lung that is compressed will not expand and contract, therefore, the parietal and visceral pleuræ will not slide over each other, or their movements will be limited more or less: this means that the pleura is put completely or partially at rest. The great importance of such rest is easily understood. The organs contained in the thoracic cavity are normally subjected to continuous, rather strenuous movements. The diffusion of inflammatory and infective processes is favored by active movements of the affected organs. Whenever inflammation or infection of any organ occurs, nature tends, first, to spare the affected organs; second, to limit any infective or inflammatory process from spreading; third, to start immediately a process of reconstructive defense of the affected organs. In order to obtain these important aims nature, as a first step, tends to put at rest the infected or simply inflamed organs. In inflammation of the pleura, nature tries to put at rest the infected or inflamed pleura. The only manner in which nature can put the pleura at rest is to limit or prevent completely the sliding of the visceral and parietal pleuræ over each other; this can be accomplished only by fluid accumulating in the pleural cavity, which, by preventing movements of the pleura, puts the pleura at rest. We can therefore logically assert, as an incontrovertible fact, that the accumulation of fluid in the pleural cavity puts the parietal and visceral pleuræ at rest; that, according to physiopathological laws the infected or even simply inflamed pleura needs such a rest; that consequently the presence of the abnormal amount of fluid in the pleural cavity represents the most valuable natural process of defense; that unless we can substitute a more valuable medical process of defense than the accumulation of fluid, devised and put in action by nature, we have to act in such a manner that the work of nature is not hampered.

The defensive character of the presence of an abnormal quantity of fluid in the pleural cavity that puts at rest the affected lung and pleura is confirmed by the following daily observations: First, the death rate of patients, whose pleural fluid is evacuated early, is much greater than when evacuation is delayed. Second, during the acute or subacute stages, fluid in the pleural cavity forms again and accumulates a few hours after it has been removed.

We have dealt with the subject of an abnormal quantity of fluid in the pleural cavity without taking into consideration the different characteristics of this fluid, which may be clear, sterile, thick or purulent, and the clinical evolution of the accumulation of this fluid. We wanted first to establish the fact that this abnormal fluid represented always, in every case, a most valuable process of defense, before discussing the best means of treating rationally the complications that may arise on account of the presence of such abnormal fluid.

We have, however, to meet the objections that can be raised against this defensive conception of the presence of an abnormal quantity of fluid in the pleural cavity, when this fluid might appear to be directly or indirectly the cause of serious symptoms, complications and even death. Clinically we can divide the cases in which accumulation of fluid occurs in the pleural cavity into extremely acute, acute, and subacute cases. In the extremely acute cases the patients generally die in a few days, but not on account of a rapidly accumulating abnormal quantity of fluid in the pleural cavity which obviously could easily be decreased by aspiration, but notwithstanding such rapid accumulation (which *per se* might cause dyspnea, cyanosis and other conditions), that is, notwithstanding the quick and prompt attempt on the part of nature to prevent the rapid spreading of dangerous and destructive pathological processes. To charge the death of the patient to the abnormal accumulation of fluid in the pleural cavity would be as logical as to charge the destruction of a building that was the prey of a sudden and powerful fire to the water that was used in order to extinguish it, no matter what damage the water under great pressure and in great quantity might have caused *per se*. In all cases, whether extremely acute, acute, or subacute, the abnormal accumulation of fluid in the pleural cavity alters the physiological relations and functions of the organs, and therefore does cause damage and trouble, at times serious.

Firemen, extinguishing a fire, always cause damage and trouble, but no one would doubt their value in preventing the spread of the fire and no one would hamper their work, because of the possible and inevitable damage and trouble that positively follow. The same considerations should lead the physicians in dealing with accumulation of fluid in the pleural cavity. No matter what damage the accumulation of fluid has caused, this accumulation is always the best means of defense that nature can muster. It is our duty, as intelligent physicians, to help, not to hamper, the good work of nature when complications arise, or prevent such complications whenever it is possible.

PATHOGENESIS

Discussion of pathogenesis, varieties of empyema, diagnosis, prognosis, treatment of the *causa prima* is omitted here for brevity's sake. We wish, however, to emphasize that the x rays are invaluable for proper diagnosis and prognosis. The causative agents must be sought first, because no empyema can be cured until and unless the causative agent has ceased its activities and therefore it is imperative to know this causative agent or agents. So it will be easily understood that empyema, caused for instance by the presence of an infected foreign body in the pleural cavity, or by a pneumococcus pneumonia, or by a subphrenic abscess, or complicated by tuberculosis, have different etiological factors that must be dealt with *secundum artem,* before the actual rational treatment of empyema is begun. In no case of empyema could a cure be expected as long as the foreign

A. B.

FIG. 3A.—Author's cannula. A, showing the upper half of cannula with ridges and points; B, showing upper half with grooves and eyelets (ring omitted). The two valves fit into each other.

monic process is still active, or until the subphrenic abscess or the complicating tuberculosis are properly treated.

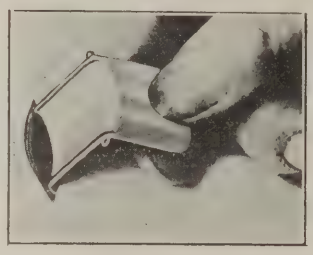


FIG. 4.—Manner of applying the cannula. The lower half is introduced first by holding the long flange, while the short flange turns around the rib and enters the pleural cavity.

BASIC PRINCIPLES OF RATIONAL TREATMENT OF THORACIC EMPYEMA

The general management of cases of empyema can be thus outlined. The patient is kept at rest; general condition studied carefully and dealt with accordingly, with a view to bringing improvement where improvement is indicated. The condition of the lungs, mediastinum, diaphragm, heart, kidney, and other organs, and such complications as constipation, anemia, poor digestion, neurotic conditions, tuberculosis, demand the special attention of the attending physician who must meet the peculiar needs of each patient according to age, sex, temperament, surroundings and other conditions. Food plays an important part in helping this class of patients. Abundant protein diet, pleasing to patient's taste, supplemented with sugar and vegetables, will help a great majority of patients, who, generally speaking, must be overfed, when it is possible. Arsenic, judiciously employed, is also very helpful. One of the most important factors helping patients suffering from empyema is comfort, especially after the operation. Repeated dressings which are more or less painful and cause great discomfort and frequent examinations do not allow the necessary physical and psychic rest, which is more essential the more septic and depressed the patient.

The direct treatment of accumulations of abnormal fluid in the pleural cavity must be based on the fundamental principle that the presence of this fluid represents a process of reconstructive defense.

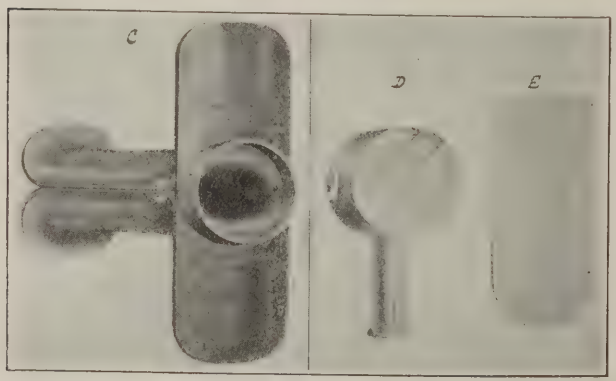


FIG. 3B.—Author's cannulas. C, showing the two valves of Fig. 3A fitted into each other, forming a large oval channel. D, cap to be applied to ring in lower half of cannula. E, rubber valve that fits in space left between cap and ring, and completely closes the oval channel formed by cannula.

Removal of pleural effusion.—Abnormal fluid, whether clear and sterile or purulent, should not be evacuated if the cause which compelled the pleura to produce it is not also removed, or its activity has ceased. The early expansion of the lung would only tend to the renewal of the activities of the pathological process and useless wearing out of the affected organs.

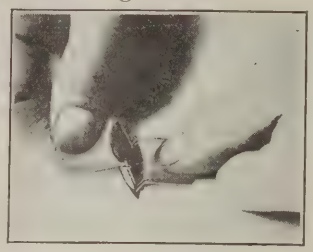


FIG. 5.—The upper half is applied by introducing its ridges in the grooves of the lower half and making the short flange turn around the rib.

Exceptions.—Removal of small quantities for diagnostic purposes, of larger quantities in order to relieve excessive pressure as often as the patient's comfort requires, until the process that caused the accumulation of fluid has subsided, or is removed *secundum artem.* The amount removed each time should not help the expansion of the lung of the affected side, but only relieve pressure on the mediastinum and the other lung and make the patient comfortable. An exception may be made in the rare cases where the pleural fluid is so highly toxic as to imperil the patient's life.

FIG. 6.—The two halves are put together by introducing the points of the upper half in the eyelets of the lower.

The line of treatment must take into consideration mortality immediate and late: the more or less rapid and more or less complete or ideal recovery. Immediate and late mortality is favored by general poor management of the case, too early operation, general anesthesia, improper operative technic; late mortality is favored by complications due to improper operative technic and poor aftertreatment. Therefore we must

First.—Study each case carefully. Do not take for granted that the case is a simple one. The most difficult and complicated case might at first appear to be a very easy and simple one.

Second.—Delay operation, as outlined above.

Third.—Use local anesthesia in all cases. General anesthesia in empyema is a surgical crime.

Fourth.—Avoid injuring the diaphragm, entering the peritoneal cavity, wounding of intercostal blood vessels. Do not break adhesions. Doing so opens new avenues to infection, causes hemorrhage, favors tearing of lung and pleura, formation of more adhesions: expansion of lung is not helped. Avoid collapse of patient by preventing rapid inrush of air in pleural cavity and sudden evacuation of great amount of pus. Do not resect ribs unless indispensable: rib resection favors osteomyelitis and formation of chronic sinuses.

Basic physical principle for the cure of empyema.—No matter what are the pathogenesis, the general condition, age, temperament or sex of the patient, or the complications, one physical condition, the im-

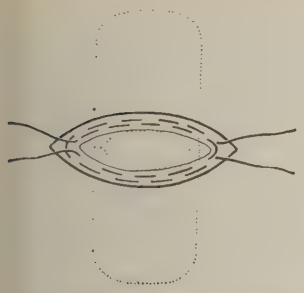


Fig. 2.—Double pure string suture applied to tighten tissues (except skin) around cannula (dotted line).

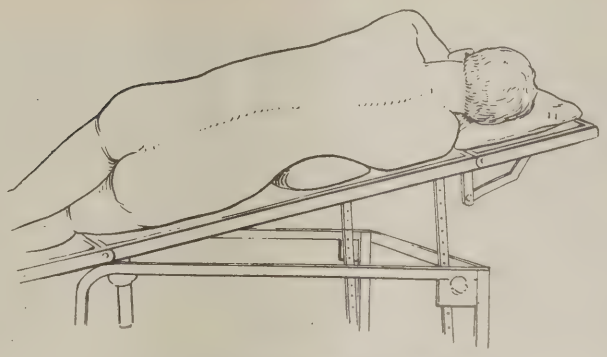
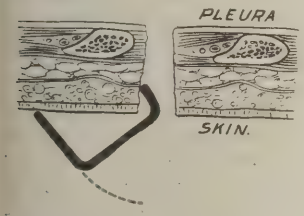


Fig. 1.—Position of patient for operation.



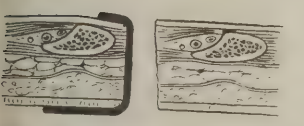


Fig. 7.—Shows schematically how short flanges turn round the rib and are introduced in the pleural cavity.

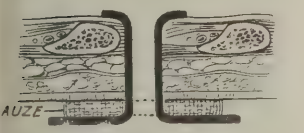


Fig. 8.—Showing schematically how cannula is secured in place around ribs.

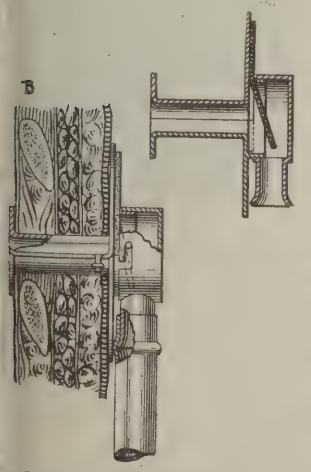


Fig. 12.—Schematic view of cannula in situ.

portance of which is too often overlooked, must be fulfilled before the patient is cured. The pleural space occupied by the fluid, whether clear or purulent, must be filled again by the lung or obliterated in some manner. On this point we shall base the criticism of the different methods of treating thoracic empyema in the fifth part of this paper.

Here we shall only remind that the normal lung expands because negative pressure in the pleural cavity compels it to expand. When we open the pleural cavity negative pressure has ceased to act and the lung fails to expand, and, as the lung is surrounded by a rigid bony cage, a hollow space results. The time treatment must be continued will be exactly that required to fill such hollow space, either by the lung itself, helped by the soft structures surrounding it, or by a surgical collapse of the bony cage.

It is selfevident that any method of treatment that does not reestablish the negative pressure of the pleural cavity will fail to obtain a rapid cure. Evacuation of the pus contained in the pleural cavity, while the negative pressure is preserved, is the fundamental basic principle of our direct method of treating empyema.

Broadly speaking, the conditions which the surgeon has to meet are 1, the presence of pus in the pleural cavity; 2, the retraction of the lung; 3, the poor general condition of the patient, who might suffer from complications, other diseases, or both; 4, the thickening and infection of the pleura; 5, occasional adhesions. Any form of direct treatment must therefore aim to 1, evacuate the pus present in the pleural cavity at the time of the operation and allow complete drainage of the pus that will form later. The means used for drainage must not, however, be the direct cause of pus production. 2. Favor early gradual expansion of the lung; simultaneous drainage of pus and expansion of lung. 3. Take into consideration and meet the peculiar conditions and needs of each individual patient. 4. Help the natural forces in bringing the pleura back to normal physiological conditions. 5. Dispose of the occasional adhesions. It is essential that these five factors work harmoniously—teamlike—and, at the same time, each help the other. If these factors do not work harmoniously they will work antagonistically, each handicapping the other, as would a team of horses, each horse pulling in an opposite direction or not at the same time. We feel that by basing our assertion, not only on our results, but on the results obtained also by different surgeons, we may conserva-

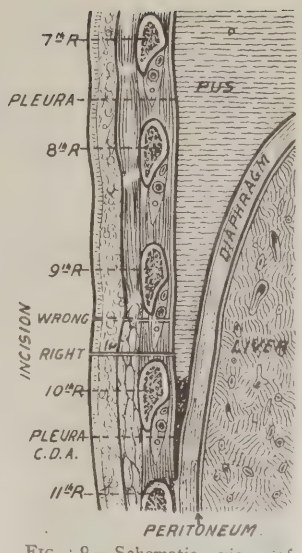


Fig. 9.—Schematic view of correct incision.

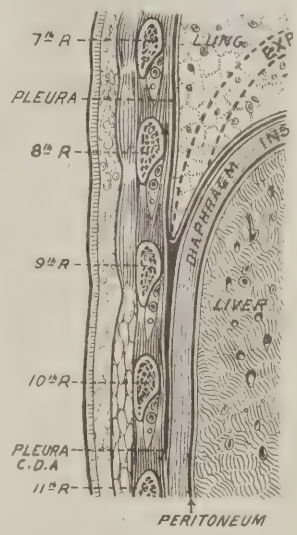


Fig. 10.—Showing why it is preferable to make the incision of the pleura during inspiration when the diaphragm is lower.

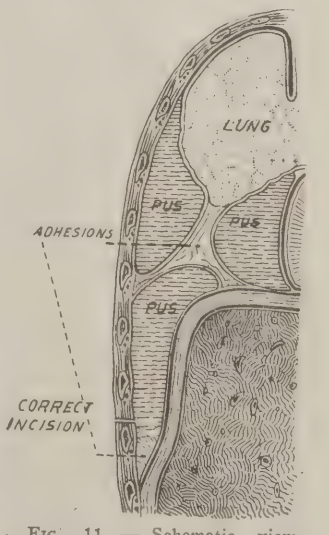


Fig. 11. — Schematic view showing that when thick pus and adhesions are present the incision should not be made too low.

tively state that the method to be described actually meets successfully the five conditions mentioned above.

AUTHOR'S METHOD

Before operation aspirate some pus when a large amount is present. To be precise: supposing the operation is scheduled for 11 a. m., pus should be aspirated at 8:30 a.m. and again at 10 a.m. These aspirations will lessen the danger of collapse at the time of operation and should be made in the intercostal space in which the operative incision is going to be made later. The intercostal space selected generally is located between the eighth and ninth ribs or ninth and tenth, the incision being made along the scapular line.

FIG. 13.—Shows schematically how patient may walk about carrying bottle for collection of pus.

Position of patient—When possible the patient should be operated in the sitting position, otherwise the position shown in Fig. 1 is satisfactory. The hand corresponding to the side of empyema is put on opposite shoulder, a pillow is put under the last ribs of the healthy side along axillary line. The position must be comfortable, widen the intercostal spaces and allow the pus to drop in the costo-diaphragmatic angle by gravity.

Anesthesia—Local anesthesia must be employed in all cases. We use our novocaine (1 to 300) adrenalin, caffeine solution prepared immediately before the operation.

Incision—Length three to six c.m., according to thickness of thoracic wall, parallel and close to upper border of rib when only intercostal space is opened; when a rib is resected, the incision is carried down to the rib at an even distance between upper and lower borders. When rib or pleura is exposed inject them with more anesthetic solution, and, while waiting for complete anesthesia, place two purse-string sutures made with chronic catgut No: 2 or 3, each suture commencing and finishing at an opposite angle (Fig. 2). These sutures must include all soft tissues except the skin and are to be tied later. During inspiration (Fig. 10) open pleura parallel to rib for about one and a half cm. and introduce the cannula, which I have devised. When a rib has been resected, incise posterior layer of periosteum and pleura in the middle line parallel to the borders of the rib. In this way injury to the blood vessels will be positively prevented.

Empyema cannula—This special cannula is made of thin nickel plated metal and is composed of two halves which fit snugly into each other and form an oval channel (Fig. 3). Each half has two flanges, one short (Fig. 3b) and roundish, another long and flat (Fig 3b). The upper half (Fig. 3b) is provided with two points near the long flat flange and the edges between the flanges form two ridges. The lower half (Fig. 3b) is provided with eyelets, a large ring (Fig. 3) and its edges form two grooves. When the two halves are put together the ridges and the points of the upper valve fit into the grooves and the eyelets of the lower half (Fig. 3). Between the upper part of the ring, which is part of the lower half, and flat flange of the upper half, there is a space which allows the insertion of a rubber valve (Fig. 3). The ring is covered with a cap that is secured in place by a slot (Fig. 3) which fits into a notch found on the ring. This cap ends with a short metal tube to which is attached a rubber tube, the other end of which is put in a bottle.

Insertion of the cannula—The insertion must be done as rapidly as possible, without attempts to evacuate the pus. The lower valve is introduced first. Hold the long flange between the index and thumb, introduce the short flange and push the cannula in with a slight upward turning-in movement (Figs. 4 and 7) until the short flange has turned around the rib and entered the pleural cavity. Then take hold of the upper half, lower slightly the lower half, introduce the short flnage by applying the ridge of the upper half within the groove of the lower half (Fig. 5) and make it slide into the pleural cavity over ridge of lower half by downward movement.

When the short flange has entered the pleural cavity, put the two halves together by inserting the points of the upper half into the eyelets of the lower half (Figs. 6 and 7). Introduce immediately rubber valve (Fig. 12) into space found between the long flange of the upper half and the ring. Now you may proceed slowly, the pleural cavity being closed, you need not fear collapse of the patient. See that rubber valve is raised up and falls back at each respiration, allowing some pus to escape. Apply cap (Fig. 12) to ring of lower half of cannula, securing it in place by introducing little notch found in the ring into groove found in the cap. Tighten and knot the two pursestring sutures, close skin around cannula with silkworm sutures; apply around long flange of the cannula some gauze saturated with thick zinc oxide ointment made with thirty per cent. lanoline, so as to make the cannula fit snugly and become airtight or, still better, gauze impregnated with collodion. (Fig. 8). Put over the site of operation a thick dressing, attach a bottle to the rubber tube and secure the bottle according to circumstances; that is, in such a way that pus can drain into it, when patient is in bed or when patient gets up and goes about carrying his bottle (Fig. 13).

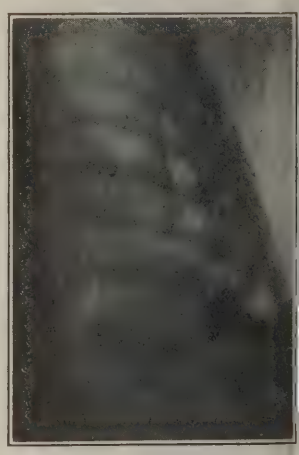


FIG. 14.—Same, ten days after operation. Patient discharged cured nineteen days after operation.

Postoperative care—The patient is allowed to sit up in bed or walk about as early as his condition allows. Many patients have been out of bed the day following the operation. Some patients complain of

pain on the site of operation, which is caused by the compression that the cannula may exercise on the intercostal nerve. The pain, however, is never very severe and is easily controlled with morphine and disappears within twenty-four hours. The postoperative care of patients treated according to instructions given above is very easy. There is practically no postoperative care, no dressing, no drainage tubes to be changed, no toilet of the skin, no lavage of the pleural cavity, no special position to be given to the patient, no painful medication of any kind—in fact, the only care required is the emptying and cleansing of the bottle that collects the pus. The patient is never disturbed for any reason for several days and generally not until the cannula is removed.

When to remove the cannula—The time for the removal of the cannula depends on the condition of each individual patient. As a general rule we can say that the cannula has to be removed when the lung has expanded and the pleural cavity does not secrete pus any longer. This generally occurs between six and twelve days after the operation. X rays are valuable in establishing the condition of the lung and pleura and should never be omitted, when available. When the cannula is removed one problem concerns the surgeon: Will the wound close too soon and pus collect again in the pleural cavity? Our experience has been that when the lung is well expanded and no appreciable amount of pus comes out through the cannula, the cannula can be removed and the wound allowed to heal without fearing any new collection of pus in the pleural cavity, because the pleural cavity is filled by the lung and the tissues can take care of the microorganisms that are still present in the wound.

However, if the patient is in poor general condition of health, and the surgeon fears that the tissues might not be able to take care of the microorganisms present in the wound, a few threads dipped in melted paraffine (Fig. 14) can be put in the wound and removed one at a time a few days after, when drainage is considered unnecessary. Do not use rubber tubings of any kind, under any circumstances: cure would be indefinitely delayed and complications may set in.

Removal of the cannula—In order to remove the cannula, the process of introduction is reversed. That is, the upper valve is removed first, the lower will then practically fall out by itself. In order to facilitate the removal of the upper valve instead of grasping it with the thumb and index finger it should be grasped with an artery forceps.

POINTS TO BE EMPHASIZED

Small amount of pus draining through cannula—On the second or third day only a few drops of pus drain out. Do not think that the cannula does not functionate; there is no more pus to drain out. Only exceptionally is the cannula occluded. We have noted only one case in which zinc oxide ointment filled the cannula. In this case an intern, without knowing how the cannula was made or functionated, removed the dressing the day after the operation and smeared zinc oxide all around the wound, filling the cannula with the same. The damage was easily repaired by cleaning the cannula and putting in a new rubber valve.

Rubber valve—Do not boil the rubber valve. Boiling makes the rubber too soft. Sterilize rubber valve by placing in tincture of iodine a few minutes.

Pulling on the cannula.—See that the rubber tubing and the dressing do not pull on the cannula. Pulling is easily prevented by strips of adhesive plaster passed like straps over the shoulder, holding up dressing and tubing.

Size of cannula.—Only one size cannula is made. It can be used in children (smallest child treated six months old) as well as in adults. In children a rib is resected, in adults the cannula is placed in the intercostal space, except when this is exceptionally narrow. Cure is so rapid that osteomyelitis has never been observed (nine cases in which ribs were resected). As the thickness of the thoracic wall varies with age and patients, it would be impossible to have cannulas that would fit each case snugly. However, it is extremely easy to make the cannula fit as snugly in a baby as in an adult with thick thoracic wall. The cannula is placed in the thoracic cavity. The deep and skin sutures are tied, as explained above. The two external flanges are pulled outward and the space left between the valve and the skin is filled with gauze impregnated with the ointment already described or plain petrolatum. Long strips of gauze wound around the cannula are ideally suited for this purpose. (Fig. 8b.)

Dressings.—If the cannula has been well surrounded by gauze impregnated with zinc oxide ointment, and the sutures have been properly applied and tied, the dressing remains clean. In case some leakage should take place around the cannula, the dressing can easily be changed without causing any discomfort to the patient.

If the surgeon wishes he can verify how the cannula functionates by removing the cap. He will see that the valve is raised up and pulled back at each respiration.

POINTS OF SUPERIORITY OF THE CANNULA OVER ANY OTHER MEANS EMPLOYED AT PRESENT

1. Operation can be performed in all cases under local anesthesia, so avoiding the dangers inherent to general anesthesia.
2. There is no necessity of rib resection or perforation. Osteomyelitis of the ribs and deformities of the thorax are thus completely prevented.
3. Mortality is greatly reduced.
4. Complete cure is more rapid and obtained in more cases than with any other method.
5. The patient is comfortable immediately after the operation and is never disturbed, made uncomfortable or actually hurt, as happens with any other method of treatment.
6. It is the only method that favors distention of the lung, with the most perfect drainage of the pus.
7. All the complications so common with other methods—chronic empyema, fistulas, dropping of drainage tubes in the pleural cavity, and other similar incidents are completely eliminated.
8. This method of treatment is the cheapest.
9. It is perhaps the only method by which double empyema can be safely operated upon.

(To be continued)

The Treatment of Severe Metabolic Arthritis*

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As the treatment of arthritis is one of the most difficult problems which we encounter in medicine it may be well at the outset to mention the various forms in which it may appear, because in examining a case of chronic joint disease the first step is the making of a diagnosis and in order to do this intelligently one must pass in review mentally all the conditions that might possibly be present so as to determine in which category the case belongs. Thus we may ask:

Is it acute or chronic rheumatism? Is it specific? Is it tuberculous? Is it an infection, due to some focus, the chief sources of which are the teeth, tonsils, head sinuses and cavities, gallbladder, appendix, colon? Is it of metabolic origin due to faults in the endocrine system alone? Is it complicated by infection from the colon or elsewhere in the body?

All of these questions should be gone over carefully, one after another, and should be either eliminated or incriminated. Infected teeth should either be filled or extracted. I feel very strongly, however, that in the past there have been a great many good serviceable teeth ruthlessly removed without due and proper consideration; therefore much good judgment should be exercised before subjecting a patient to the loss of these essential organs of mastication. Every orthopedic surgeon has had cases in which the removal of decayed and infected teeth has given brilliant results; on the contrary, we also have all seen patients suffering from chronic joint disease who upon the advice of one of their previous physicians have had all their teeth removed, many of which were sound, and, of course, no material improvement in the patient's condition resulted. The question of pyorrhea requires much careful consideration and good judgment; this affection should be treated by a competent specialist if the teeth are to be saved. In many cases in which there is only a moderate pyorrhea with good drainage, no apparent deleterious systemic effects are noted; on the other hand, I am confident that we have all seen patients in whom one apical abscess has evidently been responsible for serious bone or joint infection, and in which prompt removal of the tooth and cleansing of the abscess has resulted in speedy and complete recovery.

Infected tonsils are better out, unless the physician has sufficient skill and both he and the patient can give the necessary time for a course of treatment that will thoroughly clean up the infected crypts. Personally I prefer enucleation, but I have seen cases in which a tonsillar infection was successfully handled by the conservation method, as proved by the abatement of symptoms and their final disappearance. The small buried tonsil should be removed upon suspicion.

Frontal sinus and antrum disease should be handled by a specialist.

*Read before the Orthopedic Section of the New York Academy of Medicine, December 19, 1924.

Metabolic arthritis is probably the most common form of arthritis occurring in adults and possibly i the least understood. Although this form of diseas is most frequently seen in adults it is by no mean confined to them, but is occasionally seen in childre in all stages of its development. In metaboli arthritis there is the acute active stage and it is dur ing this period that the disease is most amenable t treatment; if the patient receives proper attentio at this time we can therefore give the best prognosis Then comes the subacute or more advanced stag and, finally, the chronic and quiescent stage of de formity, during which there is little or no pain, an little or nothing can be done for the patient, but h is left badly crippled and in many cases almost help less.

As metabolic arthritis is so closely allied to wha the laity call rheumatism—and it is hard to get awa from that term if we are to talk to our patients i language which they can understand—it often re quires a good deal of diagnostic acumen to differen tiate between joints affected with chronic rheumat ism on the one hand and those involved in an ar thitis on the other hand. It is quite possible to have in the same individual, one joint affected wit chronic rheumatism and another joint with arthritis so it is difficult to say just where chronic rheumatism ends and arthritis begins. The term rheumatism ha always been used so loosely that perhaps at the out set these terms ought to be defined. In a brief pa per it is impossible adequately to define or to d justice to a description of the diseases commonl known as acute and chronic rheumatism and arthriti and, therefore, in order as to make ourselves bette understood I must first state the premises upo which these subjects are considered. One canno possibly understand chronic rheumatism unless h has a clear idea of acute rheumatism. In acut rheumatism there are three outstanding features 1, rise in temperature; 2, joint symptoms; 3, aci excretion from the skin (1). In a great many case only the second feature may appear. In acute rheu matism as long as the skin remains acid, the patien should not be considered as well and if this acidity persists he will probably have a relapse, or at leas a prolonged convalescence. In uncomplicated acut articular rheumatism when the patient recovers, th joints return to their normal condition. If there i not a restoration of the joints to their normal con dition, there is some complicating condition, prob ably a focal infection.

Of chronic rheumatism we see little in this coun try and the same is true of gout. This is probabl due to the fact that our houses are better heated In Europe people are accustomed to sitting before an open fire and then going out into a cold hall an in this way they become suddenly chilled. This over heating and sudden chilling of the body interfere with the function of the skin as an excretory organ (1). In this country we see more rheumatism of

FIG. 1.—Case II. Röntgenoscopic view of colon before treatment. The subject shows a partial filling of the right colon. Whether feces and gas were in the right colon before the barium enema was given, or a portion of or all the residue was forced back by the barium enema, I am unable to state. The hepatic flexure is very low.

the focal infection type, probably due to our higher living, the use of less plain food, rapid eating, the consumption of rich foods, more cold storage and so forth.

Endocrine dyscrasia, alone or complicated with focal infection from the colon or elsewhere, is frequently at the bottom of metabolic disorders and therefore this phase of the subject must be given careful attention. We speak of endocrine disorders and blame the endocrine glands for failure to perform their functions of preventing toxemia by keeping the food sweet and in proper condition for assimilation, when in reality the endocrine glands have been working to their utmost capacity, in spite of overwhelming infection from one or more foci.

The taking of the life history of the patient should be thorough and searching, going back to early childhood; for instance, if a patient gives a history of more or less chronic intestinal trouble, whether it be diarrhea, constipation or only occasional gastrointestinal upsets, this will be sufficient to draw the practitioner's attention to the gastrointestinal tract, and in many cases the site of the trouble will be found there. An abdomen which is painful upon moderate pressure needs treatment and, ruling out the acute infections such as appendicitis and cholecystitis, should certainly not be passed over lightly when one is searching for focal infection. The gallbladder should be carefully examined for infection. This does not necessarily mean operation; in the absence of gallstones medical drainage is popular at the present time. In my joint cases due to metabolic disturbance I am making a careful comparative study as to the frequency of gallbladder and colon infections as causes of chronic joint affections and thus far I am much impressed with the far greater frequency of colon infections.

We have the great advantage in colon infections that it is possible to gain direct access to the organ and to wash it out as often as it is necessary. It has been my experience that the colon is very frequently the seat of chronic infection and the direct cause of a large proportion of the cases of chronic arthritis. The colon as an infectious organ should be handled without gloves inasmuch as it causes more infections in bones and joints than all other infective foci combined. For years I have realized the menace of the colon as a source of infection, but the ordinary rectal tube, fifteen inches long and of small calibre was entirely inadequate to cope with the situation. In many of these cases there is atony of the colon and it is that which actually requires treatment. For the time being we must dismiss from our minds the swollen and painful joints and direct our attention to what lies back of this manifestation—the real cause of the disease.

Colonic atony has for years been recognized by the internist as a medical entity and has been treated by drugs and diet with little success, but as far as I have been able to ascertain, the important part played by an atonic colon as an etiological factor in chronic joint disease has not been given much thought. The colon has a muscular coat, the function of which is to keep the waste matter in the intestines moving on. If, owing to improper and rapid eating, the colon gets sluggish and the waste material does not move along properly we are going to have, sooner or later, an impaired organ with the

FIG. 2.—Case II. Röntgenoscopic view shows condition of colon following two weeks daily treatment. Right side ptosis markedly improved; the hepatic flexure and cecum raised; the colon resting in about normal position; a partial transient loop at the splenic flexure, and a loop in the pelvic colon. There still remains an incompetency of the ileocecal valve.

inevitable result, the formation of inflammatory products and toxins. The lining membrane of the colon becomes coated with mucus, fibrin, cocci and other inflammatory products, including eventual bacterial invasion of the mucosa and as a final consequence the muscular coat atrophies. The most effectual way to remove the toxic coating together with the other inflammatory products, from the lining membrane of the colon is by frequent irrigation, and the way to increase the muscular tone is to cause the colon to exercise itself. If we pass a colonic tube of sufficient length and size through the colon we accomplish both these objects. The organ is thoroughly flushed out and as soon as the rubber tube is introduced, the colon at once tries to expel it and thus exercises itself and increases its tone. By repeating this process daily for a sufficient length of time we have a colon with a healthy, active lining membrane free from infection and with a strong muscular coat having a good tone.

After the colon has been thoroughly cleansed and freed from inflammatory products, the Morse wave current may be used; this causes rhythmical contractions and relaxations of the colon. We employ a current that causes eleven contractions a minute.

I use an apparatus in which the shortest tube used is thirty-two inches long and the longest one fifty-seven inches, with calibre up to forty-eight French. Such a tube can be passed through the transverse colon and down the ascending colon to the cecum.

Schellberg (2) describes the importance of the tenia coli muscles. He compares to the muscles of the serpent these longitudinal bands, which are capable of pulling the left colon into loops, thus raising the cecum as high as the hepatic flexure. These muscles are controlled principally by the pelvic nerve. I have taken some röntgenographic views that go far to prove this contention.

Schellberg maintains that the tenia coli muscles act like rubber bands. I am unable to detect at present whether or not it is the stretching of these muscles which causes the greater part of the colon to be drawn over to the left side.

The point of the tube was passed midway across the transverse colon before the left colon began to coil. Then the coiling of the colon caused a sharp angle at the splenic flexure, clamping the tube and pulling the point down low in the pelvis. Further advancement of the tube aided the colon to coil in the left abdomen, where about forty-six inches of colon was reached with the tube. There is no doubt that at this point the cecum could be drained and medicaments applied. However, the procedure was as I have described. The tube was then removed and the patient was allowed to empty the colon from the right side to the left. I intend to make a further investigation of this physiology of the colon.

The colon irrigations should be given daily for the first three or four weeks, after that they should be given at least two irrigations a week. In my experience the patients have made the quickest recovery who have had daily irrigations, in other words the more thorough the mechanical cleansing at short intervals the better the outlook.

The laboratory work is important. After the first irrigation the report of the pathologist helps to determine just what solutions shall be used for the irrigations. An alkaline stool needs an acid solution and an acid stool requires an alkaline solution, while for a spastic colon a colloid silver solution should be used. After a number of irrigations have been given and the colon has been sufficiently cleared of fecal matter, and after the laboratory reports have been received, if there is a low count or absence of Bacillus acidophilus, these germs are implanted in the colon after each irrigation. I feel that this organism is important and that a patient who shows a high acidophilus count (forty per cent. to fifty per cent.) present much more favorable conditions on which to work than one whose feces show few or no acidophilus. The implantation of acidophilus changes the intestinal flora; it has for its purpose the killing off the pyogenic organisms and the prevention of their growth. The Bacillus aerogenous capsulatus, as you know, is really the Welch gas (anerobic) bacillus, which causes fermentation and by increasing the acidophilus these microorganisms appear to be successfully combatted; therefore I have found a low acidophilus count to be an indication for further treatment. In our laboratory we have grown cultures of acidophilus and have found that streptococcus will not grow in a medium where there is a fair amount of acidophilus.

These patients usually have considerable intestinal indigestion as shown by inspection of the stools after irrigation. This condition is simply one of the etiological factors which go to make up the condition of colonic atony. I usually treat these cases with the endocrines thus stimulating the colon to better action by using nature's own products. In treating patients suffering with such a complex condition no symptom is too trivial to be overlooked.

A patient with septic arthritis usually has a low percentage of hemoglobin and a low blood pressure.

These patients also have a low alkaline reserve and therefore as collateral treatment I use colloidal lime and preferably by the intravenous route. Of course lime may be administered by the mouth but in my experience the intravenous method has been much more effective. Iodine is so often deficient in these cases that this drug has been added to the lime and introduced directly into the circulation whenever there was evidence of hypothyroidism.

If there is one thing in my practice that has made a deep impression on me, it is the conviction, that no one ever gets a chronic arthritis unless the general health is at a low grade, nor have I ever seen permanent recovery until the general health has been raised to that degree which would be called health for that individual. So much for the principle and my purpose in bringing this subject before you is to call attention in an especial manner to the atonic colon and terminal ileum as a large cause of that type of ill health which conduces to arthritis, and that since I have had recourse to colonic irrigations, properly administered, together with systemic treatment, my recoveries have been far more frequent than under the old system of looking for and cleaning out suppurating foci.

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Death Following the Intravenous Injection of Distilled Water in Mistake for Saline Solution

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Recently, in a local hospital, I ordered an intravenous injection of physiological saline solution containing adrenalin for a patient who had a weak pulse during an abdominal operation. After 125 mils of the solution had entered a vein in the arm, convulsive respiratory movements developed, and the patient ceased breathing and became pulseless. The heart did not respond to massage through the open abdominal wound and through a needle introduced into the heart bits of soft clot were aspirated. After the injection of forty minims of 1:1000 adrenalin solution into the heart, and additional cardiac massage, feeble but rather slow contractions were resumed for a few minutes only, and further cardiac massage and the additional injection of about one hundred minims of adrenalin solution and thirty minims of digalen directly into the left ventricle produced no response.

In the meantime, 550 mils of saline solution with adrenalin, had entered the veins and on incising the external jugular vein and compressing the heart, watery, red blood and small, soft clots were expelled. A chemical examination of the saline solution employed showed no trace of chlorides. We had injected distilled water!

Of the nine flasks in the operating room labeled "salt solution," seven contained no chloride. The pharmacist was in the habit of refilling the stock bottle of concentrated saline without renewing the label, and no salt had, on this occasion, been added to the distilled water in the bottle. A trained observer would have noted the absence of refraction waves as the measured portions of the supposed concentrated solution were added to the flasks of distilled water on the operating floor. But, in this case, dilution had been delegated to an unsupervised pupil nurse.

IMPORTANCE OF PROPER SAFEGUARDS

Impressed by the great danger from ignorance or carelessness in the preparation of solutions for intravenous use, we would urge all hospital authorities to make sure that proper safeguards are used in the institutions they serve.

In some of our better pharmacies, three prescription clerks check each other to avoid error in compounding; such an error as led to the death of one of our best known urologists a few years ago. Possibly there may be other hospitals in which the making of saline, and other surgical solutions, is delegated to a pupil nurse, or to a pharmacist who is not specially instructed or supervised. In our opinion, for the average hospital the slight additional expense of accurately made tablets or ampoules of powder is justified by the reduced liability to error, as compared with extemporized concentrated stock solutions, and it is also our opinion that at least two trained and responsible persons should check the accuracy of all preparations for intravenous administration.

In our patient, other factors—syphilitic aortitis, spinal anesthesia, emotion, and operative shock—must be considered as possible causes of death, but none of these explain the alteration of the blood with multiple clots or emboli in the heart and vessels immediately after the collapse. The chief danger period of spinal anesthesia is from ten to twenty-five minutes after the injection. Here, thirty-five minutes had passed and the patient had reacted from an early circulatory depression, and was given the intravenous injection not because it was absolutely needed, but as a precautionary measure.

REPORT OF CASE

The patient was a fairly well developed colored woman of twenty-eight years, who was admitted for persistent nocturnal attacks of abdominal pain with vomiting, that had been ascribed to cholecystitis, but that probably were due to aortitis. When brought to the operating room, the patient was emotional, and fainted when seated on the operating table, the systolic pressure falling from one hundred and twenty-four to sixty. Six centigrams of stovaine were given through the first lumbar interspace, and ten minims of adrenalin subcutaneously. The systolic pressure soon improved and the pulse rate fell from one hundred and twenty to ninety-eight. Abdominal exploration revealed an imperfectly developed left kidney, a chronic inflammatory disease of the uterine adnexa, with small uterine fibroids and no evidence of disease of the gallbladder. Owing to the fainting of the patient, the operation was somewhat delayed, and thirty-five minutes after the spinal injection during the abdominal hysterectomy, as the patient seemed rather clammy and weak, although the respirations were regular and the pulse better than at the beginning of the operation, a prophylactic intravenous injection of adrenalized saline was ordered.

Five minutes after starting this injection, and after 125 mils of solution containing about five minims of adrenalin had entered the vein, respiratory difficulty and collapse occurred, which did not respond to cardiac massage through the abdomen or chest; or to repeated intracardiac injections and artificial respiration. Examination of the heart shortly after death showed many smooth, yellow plaques lining the coronary arteries and aorta. The anterior coronary artery was nearly occluded. The heart was normal in size, and degeneration of the myocardium or deformity of the valves was not evident. The blood showed marked hemolysis, but gave no Wassermann reaction.

It is true that the reaction from the intravenous injection of a few mils of distilled water is not especially dangerous, but the extensive hemolysis, and tendency to coagulation produced by the injection of large quantities of distilled water may be rapidly fatal.

Recovery has been reported after the intravascu-

lar injection of large amounts of distilled water. But such injections must be considered as very dangerous, especially in a weak patient. Besides the hemolysis produced, distilled water tends to throw the globulin out of solution and to shorten the clotting time, conditions favoring thrombosis and embolism, and consequently sudden death.

2008 WALNUT STREET.

An Efficient Method of Hemostasis Without Suture*

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The success of a surgical operation is dependent on several factors, two of which are despatch, and the rapidity and completeness of hemostasis. Surgeons the world over are constantly striving to improve their technic so as to reduce the time factor and to effect complete and permanent hemostasis.

Recently we have used the endotherm knife (needle), to replace the scalpel in opening abdomens and in removing breasts, even doing a complete breast operation without once picking up the surgeon's knife. This new needle cutting method (acusection) has proved useful in stopping capillary and skin oozing and in sealing the lymphatics; larger bloodvessels which bleed freely are caught with forceps and then coagulated with bipolar endothermy in place of a ligature; this is done by switching the machine from the undamped high frequency acusection current (endotherm cutting needle) to the damped high frequency coagulating current which continues to pass through the same electrode. The original technic for checking hemorrhage then was to stick the needle electrode into the tissue at one or more points around the end of the hemostat and to hold it there until the tissues were coagulated and the bleeding checked.

While I was thus engaged following a radical amputation of the breast the electrode happened to touch the clamp itself and caused a spark at the point of contact. This gave me the idea of running the current down the clamp and in this way concentrating it more directly on the bleeding vessel and on it alone. I tried it out and at once noted a neater area of electrocoagulation and less injury to the surrounding tissues than by the previous technic. This therefore appears to me to be an ideal method of hemostasis, except in large vessels.

TECHNIC

The technic is simple (Fig. 1). The operator grasps the clamp on the vessel in his left hand and holds it at right angles to the surface and clear of all contact with the body except at the tip where the vessel is caught. With the right hand the active electrode (needle) touches the hemostat at any convenient point and remains a fraction of a second or longer when a small ring of electrocoagulation forms at the end of the instrument, which is now removed. There is no after bleeding and the small area of coagulation is soon absorbed without slough or hemorrhage.

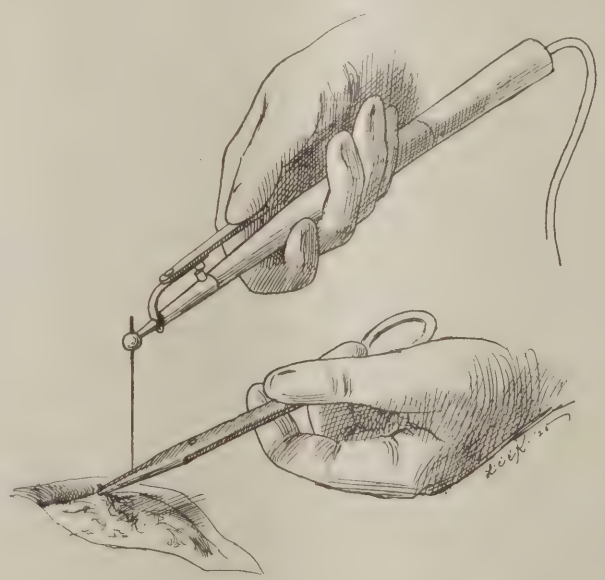

FIG. 1.—The figure illustrates the technic of hemostasis without ligature. The clamp grasping the cut vessel is held in the left hand. Holding the electrode in the right hand, the clamp is touched at a convenient point; the current then runs down to the vessel, which it coagulates. In this illustration the vessel is made a little more prominent than usual; the method is efficient, however, even though the vessel may be situated quite deeply in the tissues.

WARNINGS

1. Be careful not to touch any other part of the patient with the hand holding the clamp to be electrified, thereby avoiding a short circuit which would burn patient or operator.

2. In checking bleeding from primary branches of large vessels such as the axillary artery or vein the coagulation should be done at a distance from the larger trunk. If this is not observed, injury may occur sufficient to cause a secondary hemorrhage, or the current may coagulate the blood contained within the larger vessel, possibly partially occluding its lumen.

ADVANTAGES

1. With this method few ligatures are needed. One half or one third the time is required to lift the clamp in one hand and touch it with the active electrode (needle) in the other than to tie off the vessel (using two or three knots) and cut the ligature.

2. It is easy to realize the great saving in ligature material with this method of hemostasis—no mean factor in the economy of the operating room.

3. Less foreign material is left in the wound by the coagulating method of hemostasis than by the ligating technic. Certainly a little coagulated tissue is easier to absorb than ligature material. Per primam healing is not hindered.

1418 EUTAW PLACE.

*From the Howard A. Kelly Hospital, Inc., Baltimore, Md.

The Problem of Gastric Cancer*

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In June, 1924, Dr. H. A. Christian, of the Harvard Medical School, read a paper at the meeting of the Association of American Physicians entitled Some Observations, Largely Pessimistic, on Early Diagnosis of Cancer of the Stomach. He made a startling statement to the effect that we had made no progress in the diagnosis and treatment of cancer of the stomach, and that even the x ray had been of no help.

When I read this article I was startled, not because of disagreement, but because I found confirmation, from an authoritative source, of a conviction that had been growing upon me for the past two years. Dr. Christian said that all patients admitted on his service at the Massachusetts General Hospital presented no difficulty in the diagnosis of cancer of the stomach. They either came in with a ready diagnosis or the interns made the same from a clinical examination on admission. The x ray was of no help in disclosing unsuspected cancer. All these cases were suspected clinically and most of them were diagnosed without the help of the x ray.

Soon after my return from visiting the Mayo Clinic and several other clinics, I published a paper in which I discussed the problems of gastroenterology. One of the problems for which I sought a solution was that of the early recognition of cancer. I formulated a routine examination for my own enlightenment and I hoped to be able to detect early cancer of the stomach. But unfortunately my series of some fifty cancer cases which I examined in the past eighteen months disappointed me. Most of them were referred to me with either a ready diagnosis or a suspected one, and upon examination all of them proved to be late and inoperable cases. My examination corroborated the family doctor's suspicion or knowledge of the existence of malignancy.

The problem then of gastric cancer is early diagnosis. The following questions present themselves:

1. How can we make the potential cancer patient consult his physician earlier?
2. How should the family physician be guided in recognizing or suspecting malignancy?
3. How early should we bring to bear all our newest methods of examination and diagnosis?
4. On what evidence should the patients be exposed to surgery?

EARLY DIAGNOSIS

It is unquestionably true that cancer patients enter a hospital too late; that they consult the röntgenologist or the stomach specialist too late also. Who is to be blamed for it? The general practitioner? No; at least not entirely. I find from experience that the general practitioner who refers a case to me, for instance, is not always the first one consulted by the patient. He may be the third or the fourth. I feel sure that the general practitioner of today is sufficiently familiar with the problem to suggest a study of a particular case in which the patient presents himself with gastric pain and vomiting, during the cancer stage. On the other hand, it is quite likely that the patient comes to the physician for a cursory examination and a prescription after ignoring his symptoms for a long time, entirely ignorant of or rejecting the idea of the consulting physician that there may lurk some danger in the apparently vague symptoms. The patient still looks well, having lost no weight, and is still attending to business. The same patient, not feeling better, in a few days consults another physician; tells him what the first one suspected and even denies that he vomits or has other cardinal symptoms.

The second doctor, sensing the patient's attitude and wishing to quiet his fears, prescribes a mixture of bismuth with morphine or codeine, and calls the disease indigestion, or gas in the stomach. The patient goes away lulled into the belief that there is nothing wrong with him. The codeine or morphine or limited diet relieves him for awhile and he comes again to the doctor exultingly and informs him that he feels fine, except, that once, after partaking of some fish or a tiny piece of chicken the night before, he vomited; otherwise, he feels fine. The physician hates to disillusion him and tells him not to eat chicken, and gives him some other medicine without morphine or codeine. Next day he gets a hurried call to see the patient, who is very sick; he cannot eat, he vomits, and has pain. The whole family is thoroughly alarmed, the neighbors offer their help, suggesting this doctor or that doctor, or they may even suggest calling in a specialist. The specialist is called, and seeing the excitement of the family, he quiets their fears and prescribes five drops of nux vomica and ten drops of dilute hydrochloric acid.

On the following day the first practitioner is called back and after listening to the whole story, with chest swelling at his own superior knowledge, he suggests that the patient go to a specialist's office, who will study his condition from every angle, and then decide what should be done. Thus the patient, after wasting two or three months, lands at the hospital or at the specialist's office.

I hope you do not consider this picture, which is drawn from personal experience in the last few years, an exaggerated one. I am sure all of you can duplicate it. The family doctor who wishes to retain his patients is afraid to breathe the word "cancer."

The problem of gastric cancer reminds me of the problem of tuberculosis some twenty or twenty-five years ago. Then, too, both physician and patient were afraid of the diagnosis of tuberculosis because it seemed so hopeless, and the patient was treated for chronic bronchitis for years. But with the dawn of the twentieth century medical and lay propaganda,

*Read as part of a symposium on cancer, during cancer week, before the Southeast Branch of the Philadelphia Medical Society, November 6, 1924.

carried on by the chest specialists and sanatoria, spread the gospel of the curability of tuberculosis, provided it was recognized early.

In our eagerness to make early diagnosis we must be willing to make mistakes for the sake of safety. In tuberculosis certain incipient and even preincipient stages are recognized and the physician who makes the diagnosis, even of the incipient stage, does not hesitate to remove the patient from his occupation, whatever it may be, and give him the benefit of a cure. We must forget the textbook picture of cancer of the stomach,—that picture of cachexia, pain, vomiting, loss of weight, and a palpable tumor. What horrors it brings up! Only then will we begin to recognize early cases.

THE RECOGNITION OF MALIGNANCY

The second question which will now be discussed is most difficult to answer; but a few suggestions that have aided me may also be of some help to you. The answer will be in the form of specific cases that came to my notice.

When a man, a hard working laborer, or a business man, always in good health, begins to complain a little of his stomach, at the age of forty or over, suspect cancer until you are able to rule it out definitely. I know of two patients during the past six months who were expressmen by occupation. One patient will tell you that previously he could eat and digest leather; but now his appetite is poor, he vomits occasionally, but does not lose weight. Such a patient should be subjected to a thorough examination. This advice may seem selfevident but I know that for weeks or months such patients are being treated in the dark without an examination. Do not feed them with medicine and do not make yourself ridiculous by telling them that it is gas or indigestion. Subject them to a thorough examination, even if you have to frighten them. You must take the bull by the horns. If you lose one patient because of frightening him, you may gain others because you understood the gravity of their condition much sooner than others.

THOROUGH EXAMINATION

In examining such patients do not be satisfied with half measures. I know of a case in which the general practitioner tried to do his best by referring his patient early to a supposed specialist. The latter passed a tube, found an achylia and treated the patient for weeks and months for anacidity by lavage and dieting. Three months later a surgeon was consulted and thought he felt a mass and suggested an x ray. The patient then came to me. It was now easy to establish by any method the far advanced condition of the cancer. This patient, I felt, was sacrificed by our halfhearted methods, our egotism, and our proprietary rights in our patients. Is it necessary to emphasize that achylia in a person heretofore healthy is of great significance? I do not say it is pathognomonic but it should point to the need of a thorough examination by all the methods at our disposal. Another patient may come to you complaining of lost appetite, looking rather thin, and giving a history of cramps and a burning sensation in the epigastrium for several years. He had been treated for disease of the stomach for fifteen or twenty years, but lately he had lost his appetite completely, particularly for meats, and vomited occasionally, which he had not done before. In a case like this, after you have gone more thoroughly into the history you will not be far wrong in suspecting an old gastric ulcer with, perhaps, some malignant change.

Needless to say no tonics or stomachics should be given before a thorough examination is made. While the percentage of gastric cancer ingrafted on an old ulcer has been reduced, according to recent statistics, and although some authorities even deny such occurrences, the physician undertaking to treat such a patient should have a clear idea underlying the symptoms. A simple stricture of an old pyloric ulcer may produce the above mentioned symptoms. But an x ray study will differentiate a benign stricture of a healed ulcer from malignant obstruction. The prognosis would be radically different in the two cases and without a thorough investigation it is impossible to tell which is which.

MASKED MALIGNANCY

Still another patient may come to your office, a person with a definite history of tuberculosis, with some of its classical signs, and when the gastric symptoms predominate we should not omit an investigation. Two such cases came to my knowledge recently, in which malignancy developed but was ignored for months on account of the pulmonary condition.

A woman may consult you and complain of vomiting and anorexia. She tells you that she has repeated attacks of gallbladder trouble with signs pointing to the presence of gallstones. Do not be too easily satisfied that this woman is suffering from cholelithiasis only. You may be surprised to find malignancy of the lower end of the esophagus, or of the gallbladder or even primarily of the stomach, or quite often a malignancy of the liver.

And still another patient may come to you complaining of constipation and slight pain in either groin—something which he has never had before; he always had a regular stomach, had already tried to physic and even diet himself. He feels somewhat weak. Or, he may tell you that he is constipated for a few days—feels full and then has a loose bowel movement with or without blood, with or without mucus. Don't add insult to injury by prescribing some of your favorite mixtures but make a study of his colon first.

These suggestions and don'ts may seem to you too selfevident, but I can assure you that I come across their infraction and meet instances almost daily of their being ignored by the general practitioner. We sin more by omission than by commission.

Now suppose you follow my advice and in your overanxiety examine your suspected patients without loss of time, on your part, say a dozen a year, and in ten you get negative reports, and only in two are your suspicions of early malignancy confirmed, either in the stomach, or the cecum, or the sigmoid —think what a gain it would be if every doctor would be able to do that. Out of fifty or sixty thousand patients who die annually we might thus save a considerable number, by the application of the knife early, which is the only curative method.

I have not given a description of the full symptomatology of cancer of the stomach, simply because I want you to recognize the early cases that come to your notice with only one or two symptoms and no more. The typical inoperable case is too clear and is easily diagnosed.

SIGNS TO AID IN EARLY DIAGNOSIS

The next question is, What signs should guide the diagnostician in making a diagnosis of early cancer? On his shoulders rests a tremendous responsibility, but no more than on the tuberculosis specialist who will interrupt a young person's career, by not taking any chances with an incipient or a preincipient stage of tuberculosis.

THOROUGH X RAY EXAMINATION ESSENTIAL

We assume that a thorough clinical examination of a particular case under discussion will exclude kidney disease, diabetes, heart disease, syphilis, pernicious anemia, and tuberculosis as being the cause of the vomiting and pain, and that the symptoms are entirely focused in the gastrointestinal tract. The physical examination should be followed without delay by an x ray examination and this should be as thorough as possible. The routine should include esophagus, stomach, colon, appendix and the gallbladder. The röntgenologist too often does what is specifically asked for by the referring physician. When a patient is referred for an x ray of the stomach or the gallbladder, they do that and nothing else. A recent case may illustrate what I mean. A person was studied in a well known hospital in this city and the patient, perhaps not making herself clearly understood, pointed to her epigastrium. The stomach was x rayed and found negative. She left the hospital and landed in another hospital, where further study was made and the gallbladder x rayed and no more. A pathological gallbladder was found and an attempt to pass a duodenal tube for the purpose of drainage was unsuccessful on several occasions. Finally the patient was fluoroscoped with the tube in the esophagus and we found an obstructive lesion of the lower end, most likely carcinomatous.

The best opinion of the most prominent x ray specialists in the country is that irrespective of what is asked for, a patient should be rayed from mouth to rectum in arriving at a diagnosis of a gastrointestinal condition.

PYLORIC INVOLVEMENT

Lesions of the pylorus are the earliest to diagnose from the röntgenological point of view. Clinically, also, these types produce the earliest symptoms. At the earliest time there will be a dilatation of the stomach with consequent retention of the barium meal after six hours; rapid emptying of the stomach in the absence of an ulcer history will indicate infiltration of the pylorus and causing it to gape. A filling defect, slight or marked at or near the pylorus, should also signify early malignancy, especially in the absence of an ulcer history. Roughly speaking, a little over fifty per cent. of the cases of cancer of the stomach occur at this point. More difficult are those situated on the lesser curvature of the anterior or posterior wall; but even here chronic ulcers can be diagnosed.

Sometimes, however, we find no lesion present within the stomach to explain the symptoms, yet by a sense of intuition, we may look through and beyond the stomach and locate the early lesion in the head of the pancreas. The most hopeful cases, then, are those with lesions of the pylorus or gastric antrum. And these being easiest of recognition are therefore susceptible to early treatment by surgery. In the trinity of diagnostic methods of early cancer last but not least comes gastric analysis. If achylia is present we are strengthened in our suspicion of malignancy, but the presence of free hydrochloric acid should not deter us from making a diagnosis. Dr. Friedenwald in one hundred cases of malignancy of the stomach found normal acidity in twenty-six per cent.; in six per cent. even a hyperacidity, and only in fifty-two per cent. was an absence of hydrochloric acid found. In several of my own cases the presence of the normal acidity did not deter me from making a diagnosis of cancer.

Now suppose the stomach is really negative to suggestive signs of malignancy, examination should be repeated at short intervals, if the clinical signs persist. During the cancer stage a definite indication of a gallbladder condition or chronic disease of the appendix should be subjected to operative procedure. Thus can the patients not only be cured of their symptoms, but an attempt made definitely to exclude malignancy.

PREVENTION OF CANCER

A consideration of the problem of gastric carcinoma cannot be complete without a due consideration of the phase of prevention. At an international conference of health problems Sir Arbuthnot Lane has said that cancer is the result of chronic poisoning of the tissues of the body, and in a vast majority of cases by the poisons absorbed from the gastrointestinal tract. Our only hope of preventing cancer is by obviating the development of chronic intestinal states in all its manifestations and results. Cancer is one of the consequences of stasis. Prevention of cancer can be brought about by a complete revolution in our diets and habits. In a discussion of this subject Noguchi said: "I cannot see any reason why various substances and local irritations due to abnormal alimentation cannot likewise produce cancer in the human body which is undoubtedly far more susceptible to these noxious substances than average animals." John B. Deaver, in an article on carcinoma of the gallbladder said: "If, as most authorities believe, gallstones are the most exciting factors in the development of cancer, it would seem that here one is forunately dealing with a demonstrable precancerous disease which can be efficiently eradicated by the removal of the benign disorder known as cholelithiasis." A. Leitch concludes from extensive observation and experiments that gallstones are capable of causing cancer of the gallbladder.

I have compared this problem to that of early tuberculosis in former years. The following extract would suggest the further analogy as to its control.

H. Charles maintains that in order to control

cancer incidence it should be made a notifiable disease and that cancer patients be segregated, first, in the cause of the unfortunate sufferers and to allay the growing fears of the community as to the nature of the disease (infectious or contagious), and secondly, that treatment may be given and experiments and research made under the best conditions.

CAUSE OF CANCER

I have not touched upon the cause of cancer. I only want to point out a curious coincidence that appealed to me while looking up this subject. The gastrointestinal tract, besides being enervated by the pneumogastric and the autonomic nervous system has also certain neuronodes situated at different points along the gastrointestinal tract, and Keith, their discoverer, points out their location as being in the upper part of the esophagus, at the cardiac end, in the duodenum near the ampula of Vater; in the cecum, in the sigmoid and in the lower rectum. I simply want to call your attention to the fact that it is precisely in these localities that cancer is found. Perhaps Lane is right in believing that constant irritation from the gastrointestinal tract is the cause of cancer in these regions, but I leave that thought with you for further consideration.

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Visualization of the Gallbladder With Sodium Tetrabromphenolphthalein by Oral or Intraduodenal Administration Through the Duodenal Tube*

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The ensuing ill effects following the use of the sodium tetrabromphenolphthalein as described by Graham Cole and Capher (1) render the intravenous route impracticable for clinical purposes. The intolerance by the rectum for solutions of this salt have been emphasized by these investigators. It therefore occurred to us to test the intestinal tract and, as a result of our observations, we now can definitely state that this route is adaptable for visualization of the gallbladder.

No toxic effects have ever been observed after the introduction of this essentially irritative salt into the intestines and after its slow absorption into the circulation. It appears in the normal gallbladder two to four hours later with increasing quantity to the fifteenth and twentieth hours (Fig. 1) and is entirely out at the end of thirty hours. The technic is as follows:

Fig. 1.—Visualization of the gallbladder in patient J. M. Harlem Hospital. Dense shadow of normal gallbladder obtained eighteen hours after the injection of sodium tetrabromphenolphthalein into the duodenum. This shadow was visualized only between the second and twentieth hour.

TECHNIC

For intraduodenal administration our duodenal tube is introduced on the fasting stomach about 8 a.m. and allowed to pass into the second or preferably the third part of the duodenum. An eight-ounce emulsion of acacia, in which there have been incorporated, depending upon the size of the patient, thirty to sixty grains of sodium tetrabromphenolphthalein, is then injected through the tube and the latter is removed. About thirty minutes preceding this a hypodermic injection of one sixth grain of morphine sulphate and one one hundredth grain of atropine sulphate is given to counteract the resultant nausea, increased intestinal peristalsis and the desire to move the bowels.

Exposures of the gallbladder region are taken, employing for the purpose the established x ray technic and two, four, fifteen, twenty, twenty-five and thirty-hour films are obtained, to determine the patency of the biliary ducts and the degree of filling of the gallbladder. Cathartics and enemas are withheld for thirty hours. For the oral administration of the salt, the patient is given fifteen salol coated pills, each containing five grains of the salt, on the fasting stomach with aid of cold water to start gastric peristalsis. The oral method, so far, has not proved as efficacious as the intraduodenal. The gallbladder shadows obtained after the latter method are distinct and offer an opportunity to study the pathology of the biliary ducts and gallbladder.

*This technic was developed at the Harlem Hospital with the assistance of Dr. P. Kleinkopf, resident physician, and with the kindly cooperation of the staff of the x ray department.

REFERENCE

1. Cole, Graham, and Capher: Visualization of the gallbladder by the sodium salt of tetrabromphenolphthalein, *J. A. M. A.*, May 31, 1924.

162 West Eighty-sixth Street.

Practical Therapeutics

TRYPARSAMIDE IN NEUROSYPHILIS*

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Since tryparsamide was introduced as a therapeutic agent, there has been quite a little speculation concerning its value. The results obtained by the various investigators strongly suggest that, when used discreetly, tryparsamide will be of much value in the treatment of trypanosomiasis, whether in the human or animal, and that it has a therapeutic use in certain forms of syphilis. At present we are more interested in its use in syphilis, especially neurosyphilis.

The drug was first synthesized by Jacobs and Heidelberger, and its biological action was studied by Brown and Pearce in 1915, but no systematic clinical investigation was begun until late in 1919. As a spirocheticide, tryparsamide was rated far below the other arsenicals. Brown and Pearce say, "The consideration that led to the selection of this drug for the treatment of these diseases may be divided into three groups. First, action on the animal organism: Second, action on animals infected with trypanosomes and spirochetes; and third, certain facts relating to the biology of syphilitic infections, and the part played by animal resistance in determining the course of this disease." Tryparsamide causes but little irritation when introduced subcutaneously, and it has a stimulative effect which exerts a favorable influence on the disease out of proportion to its spirocheticidal action. The results obtained by Brown and Pearce with syphilis in rabbits led to the prediction that tryparsamide would be of little value in the treatment of early syphilis where the sole purpose of treatment is directed toward rendering sterile the infected person.

Thus, in early syphilis, tryparsamide is not seriously considered as a routine treatment when the powerful arsphenamine group is at our disposal.

The results obtained by Lorenz and his coworkers in the treatment of neurosyphilis, especially in general paresis, aroused much interest. They reported in paresis the arrest of the disease in about sixty-three per cent. of their cases, improvement in about fifteen per cent., and no improvement in about twenty-two per cent., while in meningovascular neurosyphilis they reported ninety per cent. as arrested and ten per cent. improved. The reports of Moore and his associates have borne out the above experience, as their results were almost identical. With the limited number of cases at our disposal our present observations are not very different from the foregoing. In the report of Solomon and Veits the results obtained were not far superior to those of the older drugs used in the treatment of neurosyphilis.

The most important thing in selecting cases for patient. In the selection of patients for treatment, any form of treatment is the clinical condition of the just as is the case in the introduction of new drugs and new methods of treatment, we encounter the element of personal equation, which must be dealt with, and, of course, the serological side as well as the clinical aspect should receive due consideration and the two correlated. Lorenz and his associates, and Moore and his associates reported their experience with tryparsamide on a percentage basis, while Solomon and Veits gave their results by the method of comparison.

I shall now endeavor to present a brief summary of a number of cases, selected more or less at random from the hospital records:

CASE I.—A white male, aged forty-eight, with typical general paresis, was admitted to this hospital in January, 1921. He was in poor mental and physical condition when admitted. He showed loss of memory and was unable to walk unassisted. He received considerable other treatment for two and a half years when he was placed on tryparsamide in July, 1923. He received thirty-one injections of tryparsamide intravenously, and took mercury by inunction. July 7, 1923. Before treatment was begun, his serology was as follows:

Wassermann, blood,	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	13
Gold sol.	5555432100.

Eleven treatments were given with the following readings on September 19, 1923:

Wassermann, blood	4 plus
Wassermann, spinal fluid,	Neg. singles, 4 plus in other diluions
Globulin	4 plus
Cells per c.mm.	8
Gold sol.	5555543210.

Ten treatments were given with the following results on January 23, 1924:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	6
Gold sol.	5554321000

He was again given ten treatments and his serology was taken on September 4, 1924, and was as follows:

Wassermann, blood	Neg.
Wassermann spinal fluid,	Neg. in singles, 4 plus in other dilutions
Globulin	Neg.
Cells per c.mm.	4
Gold sol.	5554321000.

The treatments seemed to shake this patient up considerably, but as soon as they were discontinued he would recuperate. He is not very different from what he was four years ago. He still has a clear mentality though he suffers from motor incoordination and marked speech defect. It may be said that this patient appeared to be an unfavorable case for any kind of treatment.

CASE II.—This patient was a white male, aged thirty-three. He came to this hospital in an excited and disturbed mental state, despondent and confused with the clinical manifestation indicative of paresis, with the following serology, taken June 6, 1923:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells, per c.mm.	37
Gold sol.	5555543210.

*This paper will be read before the American Congress on Internal Medicine, March 9 to 14, 1925, at Washington, D. C.

After ten treatments of tryparsamide his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	8
Gold sol.	5555430000.

Without further treatment his serology was taken January 16, 1924:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	16
Gold sol.	5555432000.

He was given another series of ten treatments, with the following serology, November 13, 1924:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	5
Gold sol.	5555432000.

The patient received tryparsamide alone and failed to show any response clinically.

Case III.—This patient was thirty-three years old when he came to us with a diagnosis of cerebral lues. He showed the typical reaction of dementia precox imposed on defective mentality. Ht was in rather poor condition physically, before being placed on treatment. He showed the following serology May 31, 1923:

Wassermann, blood	2 plus
Wassermann, spinal fluid	2 plus
Globulin	Neg.
Cells per c.mm.	19
Gold sol.	1224210000.

After taking ten treatments of tryparsamide, his serology was as follows, September 19, 1923:

Wassermann, blood	Neg.
Wassermann, spinal fluid	2 plus
Globulin	Neg.
Cells per c.mm.	3
Gold sol.	Normal curve

Without further treatment, on January 16, 1924, his serology was as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	2 plus
Globulin	Neg.
Cells per c.mm.	3
Gold sol.	Normal curve

He was given ten additional treatments and on November 15, 1924, the results were as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	Neg.
Globulin	Neg.
Cells per c.mm.	4
Gold sol.	Normal curve

This patent had no other treatment in connection with tryparsamide. He has improved much physically though his mentality has responded slowly.

Case IV.—This is a white male patient, aged twenty-six. His case was diagnosed as general paresis, and he was described on admission as profoundly disoriented, dull, apathetic, seclusive, confused, mute and uncleanly. Left knee reflex more marked than right. General physical condition fair. On January 16, 1923, his serology was as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	49
Gold sol.	5554321000.

After being given ten treatments of tryparsamide, his serology was as follows, on September 19, 1923:

Wassermann, blood	Neg.
Wassermann, spinal fluid, Neg. singles; 2 plus, doubles; 4 plus quadruples.	
Globulin	Neg.
Cells per c.mm.	2
Gold sol.	Normal curve

On January 16, 1924, without further treatment, his serology was as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	2 plus
Globulin	Neg.
Cells per c.mm.	2
Gold sol.	Normal curve

He was given ten additional treatments of tryparsamide, and showed the following on November 13, 1924:

Wassermann, blood	Neg.
Wassermann, spinal fluid, Neg., singles and doubles; 1 plus, quadruples.	
Globulin	Neg.
Cells per c.mm.	0
Gold sol.	0111000000.

This patient has shown no change clinically.

Case V.—This patient was twenty-six years old when admitted to this hospital, was resentful at the idea of being locked up, showed great psychomotor activity, giving the clinical symptoms of paresis. The serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	23
Gold sol.	5555542100.

After ten treatments of tryparsamide were given, on September 19, 1923, the results were as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	3 plus
Globulin	2 plus
Cells per c.mm.	10
Gold sol.	5544300000.

The second course of treatments were discontinued after the seventh injection, because in the patient there developed psychic vomiting at the time each treatment was given. No mercury was given this patient, and but little improvement was noted clinically. The last serology, on November 5, 1924, was as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	Neg.
Globulin	3 plus
Cells per c.mm.	1
Gold sol.	5444332100.

Case VI.—This patient was thirty four years old when admitted to this hospital, giving a history of chancre in 1911 and showing clinical manifestations of paresis. He gave the impression of being in the advanced stage, and he was in a rather poor condition physically. His serology was as follows on October 24, 1923:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	40
Gold sol.	5555432100.

He had eight treatments of tryparsamide in conjunction with nine injections of salicylate of mercury and on March 5, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	plus
Cells per c.mm.	4
Gold sol.	5554320000.

This patient died a few weeks after treatment was completed.

Case VII.—This patient was fifty-four years of age when admitted. He was noisy, disturbed and destructive, and quite belligerent. He gave a history of syphilitic infection, but could not give the date when it occurred. He was somewhat undernourished. His serology was as follows on May 15, 1923:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	plus
Cells per c.mm.	17
Gold sol.	3334443210.

He was given eight treatments of tryparsamide and on September 19, 1923, his serology was as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid,	Neg. singles; 4 plus in doubles and quadruples.
Globulin	plus
Cells per c.mm.	5
Gold sol.	0012210000.

Now he was given nine treatments of tryparsamide, with serology as follows, January 24, 1924:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	plus
Cells per c.mm.	3
Gold sol.	0002210000.

This patient left the hospital shortly after the last course of treatments was completed. He was in excellent condition clinically. He had mercury by inunction while he was taking tryparsamide. His diagnosis was cerebral syphilis.

Case VIII.—The patient was admitted to this hospital on October 20, 1923, giving his age as forty-three years. He gave a history of chancre twenty-five years previously. He gave a clinical picture of general paresis, agitated type. On October 24, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	68
Gold sol.	5555432100.

He received eight treatments of tryparsamide, and nine injections of mercury, over a period of eight weeks, and on March 12, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	6
Gold sol.	5555542000.

He now received ten treatments of tryparsamide without mercury and, on November 20, 1924, his serology was as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	11
Gold sol.	5554321000.

The patient has quieted down mentally and is enjoying good health physically.

Case IX.—Diagnosis, cerebral syphilis. Admitted November 21, 1922, aged twenty years. He was nervous and excited and inclined to be argumentative. Vision of right eye grossly impaired due to optic atrophy; external strabismus of same eye due to impairment of internal rectus; speech defect present. Shows some general muscular incoordination. Fairly well nourished. He had considerable treatment before being placed on tryparsamide with but little improvement. On June 6, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	310
Gold sol.	22333443100.

He received ten treatments of tryparsamide, and, on September 19, 1923, showed the following:

Wassermann, blood	4 plus
Wassermann, spinal fluid	Neg.
Globulin	plus
Cells per c.mm.	15
Gold sol.	0022210000.

Without further treatment, his serology on January 16, 1924, was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	3 plus
Globulin	Neg.
Cells per c.mm.	9
Gold sol.	Normal curve

He was again put on treatment, receiving eleven injections of tryparsamide and, on November 20, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid,	Neg. in singles and doubles; 1 plus in quadruples.
Globulin	Neg.
Cells per c.mm.	6
Gold sol.	Normal curve

This patient was given twenty-one treatments of tryparsamide; no mercury was given. He has improved very much clinically and at present appears to be capable of taking care of himself from a mental standpoint.

(*To be continued*)

THE BASIS AND DEVELOPMENT OF A SYSTEMATIC RESPIRATORY THERAPY

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(*Concluded from page 412*)

Etiological respiratory therapy should also include those cases in which the surgical treatment combats the cause of all the changes and, therefore, the results can be eliminated only postoperatively by a return to the normal respiratory mechanism. The following may be mentioned as examples:

1. The pathological changes in the respiratory apparatus developing from nasal obstruction by polyps, enlarged turbinates, bronchitis, atelectasis, asthma and socalled predisposition to tuberculosis, which must be considered as the results of continued mouth breathing. They usually do not disappear if operation is considered to be sufficient, or if the patient insists upon using the nasal air passage after the removal of the obstruction.

2. Pleural emphysema, of which the associated symptoms of disease are flattening of the thoracic cage, scoliosis, drooping shoulders, atalectasis formation, a tendency toward catarrh, and tuberculinization. These do not disappear after mere removal of the pus and, similarly, the suppuration *ex vacus*, occurring as a result of retraction of the lung, does not disappear even after years, because the lungs do not apply themselves to the thoracic wall.

With the aid of the extensive material of the author's department of gunshot wounds, it may be shown for all these changes that they are the results of the insufficient respiratory activation of the diseased side of the chest, owing to the fact that in every case these (often very highly developed) changes could be made to disappear by suitable alteration of the respiratory movements.

At the same time it must be mentioned that in nearly all the cases seen by the author any additional surgical intervention could be avoided, even where several years had passed since the last operation, where the pyothorax cavity had definitely become "rigid walled," and the releasing of the lung could be easily accomplished with great deliberation and care.

The treatment of cardiac insufficiency constitutes the classical proof for the justified extension of the indication for respiratory therapy to the field of the respiratory organs. The stasis in the lower half of the body may be influenced etiologically, inasmuch as the strangulation of the ascending vena cava, which

the low position of the diaphragm produces, is relieved. The tendinous ramifications of the posterior crura of the diaphragm surround the quadrilateral foramen of the diaphragm, through which the ascending vena cava passes. Every increase of the muscular tone at this part of the diaphragmatic musculature produces a clamping off of the return blood stream in the ascending vena cava at the time of the sinking of the diaphragm.

The change in respiratory activity can act in a compensatory way in several directions. It may help the resorption of water and limit the work of the circulation, inasmuch as it combats the drying of the oral mucosa and the feeling of thirst by the elimination of mouth breathing which is so favored by dyspnea. It directly supports the return circulation by deepened aspirating inspiration, the pulmonary part by prolonged inspiration, and the abdominal organs by increased drawing inward of the abdominal musculature (active abdominal breathing) for the purpose of combating abdominal stasis as well as of expression of all the abdominal organs and also of the ascending vena cava. This example at the same time shows the differences between the formerly practised purely empirical respiratory gymnastics and the respiratory therapy developed on theoretical bases. The former was based upon the theory that respiration is a curative procedure, with an eye toward the greatest possible activity of respiration, without due regard for the form of the breathing produced thereby. The scientific analysis, on the other hand, showed that such a deepening of the respiration, carried out in the usual form, not only is not always useful, but may even be considered as the direct cause of severe injuries. In many cases the aim should be the direct opposite in a diminution of respiratory activity in general, or of one phase of respiration. Even where an increase in respiratory activity is desirable, as in atalectasis or induration formation, this increased activity must be confined to the changed portions, so as not to increase the compensatory emphysema and it must be undertaken according to very definite rules, so as to follow the principle of *primum nil nocere*.

On these grounds it appears in place now to give a short analysis of the useful and injurious effects of respiratory activity, and, first of all, to keep in mind the injurious effects:

The usually employed form of deep respiration, in which, chiefly and even exclusively, the inspiration is deepened and the expiration at least is not deepened just as much, and often even embarrassed in favor of the inspiration (air hunger), is distinctly injurious.

Just as injurious is the "holding of the breath" at the end of as deep as possible an inspiration, often advised by "breathing experts." The drawing of a breath with open mouth, often used for the easier accomplishment of the deepest possible respiratory activity, as well as the expiration through the open mouth, are similarly to be considered to be always injurious. By holding the breath, the return blood stream is kept back from the lower half of the body through the low position of the diaphragm. As a result of the inspiration through the mouth, the respiratory activity of the pulmonary apices is inhibited, thereby increasing a previously existing "predisposition" to tuberculosis, and also causing a drying of the mucosa of the respiratory passages as well as an injury of the ciliated epithelium of the same which have such a beneficent influence. From this can also be seen the usefulness of the opposite measures; the deepening of the expiration as well as the drawing of the breath through the nose. The former is of advantage because it diminishes the used air remaining in the thoracic cavity, so that sufficient renewal of the alveolar air is possible even with slight respiratory activity.

Suitably applied, the generally increased activity of inspiration (associated with increased expiratory activity) is more useful than the activity of the diseased part alone, and is therefore an apparently more specialized activity, even though the opposite holds good in general. An example of this may be seen in the combating of the asthenic habitus, the precursor of tuberculosis, enteroptosis, and other pathological conditions.

Heliotherapy in Advanced Pulmonary Tuberculosis.—I. D. Bronfin (*Colorado Medicine,* November, 1924) says that in his experience heliotherapy has not yielded encouraging results in this class of cases. Neither the favorable nor the unfavorable results can be attributed to it with certainty. It is as dangerous an agent as tuberculin if used injudiciously. There are many points of resemblance in the body reactions between radiation and tuberculin. Hemoptysis is no contraindication to its use. Extrapulmonary lesions are invariably favorably influenced by heliotherapy.

Peptone Therapy in Asthma and Other Anaphylactic Syndromes.—H. P. Miller (*Illinois Medial Journal,* April, 1924) concludes that peptone therapy in asthma and allied conditions offers a simple and effective mode of treatment. Physiological studies prove the identical nature of peptone and anaphylactic shock; peptone (proteose) treatment starts at the lower or less specific end of the reaction, while protein starts at the beginning of the chain or highly specialized end. Two tenths of one c. c. constitutes the initial dose given intravenously and repeated twice weekly. The dose is increased two or three tenths of a c. c. until about one and one-half c. c. is reached.

Therapeutic Uses of High Carbohydrate Diets.—T. Izod Bennett (*Lancet,* July 5, 1924) gives the following classification of the indications for high carbohydrate diets in adults and older children: 1, certain specific infections, such as, pneumococcal pneumonia, in typhoid and paratyphoid infections, and bacillus coli communis infections; 2, in certain infections of unknown origin, especially some cases of rheumatoid arthritis; 3, diseases of the heart and bloodvessels; 4, respiratory diseases, such as pneumonia and obscure cases of asthma; 5, diseases of the alimentary system, such as peptic ulcer, undernutrition and disorders of the liver; 6, diseases of the renal system. The most useful group of foods includes macaroni, vermicelli, noodles, and various substances prepared from flour, arrowroot, sago and other starchy substances. Many of the starchy vegetables, such as potatoes, carrots, and artichokes, are also useful.

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Rheumatism in Infancy

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The few remarks which I have to make on this subject are rather for the purpose of challenging criticism and asking for information from those who have greater knowledge of the subject than I have myself, than of throwing any new light on a matter which has been strangely neglected by pediatrists. From a perusal of the writings of most of our contemporary authorities on rheumatism we are led to believe that the periods of infancy and the early days of childhood are practically exempt from the symptoms of rheumatism. Rheumatism is either due to a specific infection or it is not. I believe that at the present time most authorities agree that the streptodiplococcus is an etiological factor of importance, but possibly not the sole factor; it is assumed by many that the specific organism of rheumatism, whether it be the diplococcus or some other filter passer, will not thrive and develop in the human tissues unless the concomitant circumstances are favorable for its growth. What these circumstances or what the required environmental or hereditary conditions may be will no doubt be thoroughly discussed by the many able contributors to this symposium[1] who, I understand, are dealing with the manifestations of rheumatism at other periods of life. For my part, however, I refuse to believe that, if rheumatism is due to the activities of some specific infective organism, the human body can be immune to its ravages at that very period of life, when its defensive mechanisms against practically all other forms of infection are notoriously defective. It is quite true that infants appear to be somewhat highly resistant to certain of the common exanthematous infections such as measles, scarlet fever, and chicken pox, but I would ask may not this apparent immunity be due either to the sheltered life which they usually lead, or to the fact that these diseases kill before they have had time or opportunity to develop the symptoms by which we are accustomed to recognize them.

I am convinced from a long experience of the institutional care of infants and young children that many casualties are due to epidemic influenza and common catarrhal infections without the true cause of the catastrophe being suspected. I have noticed time and again that, when in a general children's ward the nurses and older children have developed the typical symptoms of these conditions, the young infants have died like flies, without the manifestation of any of the usual evidences whereby the specific nature of their complaint could be recognized. Under such conditions marasmic and wasting infants often die suddenly from collapse without any obvious catarrhal symptoms or without any marked rise in temperature. Further, I have noticed the same inexplicable results follow when scarlet fever, diphtheria, and measles have been endemic in my wards. In explanation of these results I have suspected that the defensive mechanisms which in older children are called into play to arrest the development of the invading organism are ineffective or nonexistent in the case of the infant.

At different periods of life different mechanisms are called into play to protect the organism against the various dangers and disease provoking elements of the environment, and as one after another these various engines of defense are developed and the principles of the division of labor and cooperation are more strictly followed by the physiological processes of the human body, the individual becomes more resistant or immune to the common dangers of life. Striking examples in support of this general statement are to be found in the varying reactions of the human body at different periods of life, to food, thermal, psychological and mechanical injuries, it is perhaps unnecessary for me to give them in detail. But it is particularly in its reactions to the greatest of all the environmental dangers, namely the specific organisms of disease, that the body shows the greatest versatility and resource. The clinical pictures of tuberculous disease and syphilis are totally different in the infant and in the adult, and so are they in the case of practically all chronic infections.

Rheumatism is no exception in so far as we recognize its symptoms at different ages of life. In the young child it takes the form of tonsillitis and chorea, in the adolescent endocarditis and myocarditis, in the adult pleurisy, synovitis, arthritis, neuritis, and other conditions. In a general way one may say that the onus of defense in early childhood rests with the lymphatic system and the armies of leucocy-

[1]This refers to a symposium on rheumatism which will be published in the near future.

tes, in older individuals with the connective tissue cells, and possibly with endothelial cells, and the symptoms attributable to the calling into play of these special lines of defense explain the special character of the clinical picture.

My reason for making this contribution to this series of articles on rheumatism is to ask my medical confrères what are the particular mechanisms which are called into play in the case of the infant to defend it against the onslaughts of the rheumatic virus. Personally I believe they rest chiefly on the activities of the mucous membranes and the skin. I believe that we have just as much right to call a catarrhal enteritis or colitis, or a strophulus urticaria or eczema, rheumatic in the infant, as we have to call tonsillitis, or lymphatic adenitis, rheumatism in the young child. I have been in practice long enough to follow up cases of rheumatism from infancy to middle age, or at least to follow the life history of cases which have in early childhood developed into conditions which I was clinically justified in regarding and labelling as rheumatic, which in infancy have manifested symptoms of the nature stated, but which nobody would dare to call rheumatic.

Is it reasonable, or is it likely, that the infant who in most respects is almost defenseless in the face of most infections should have special immunity to the infection of rheumatism, or is it likely that the latter can be excluded entirely from his environment? Rheumatism is in most cases doubtless a slow chronic infection, but the evidences of its occasional occurrence in infancy can hardly be doubted, though the particular methods of defense may be quite different in infancy from what they are in later life.

Purulent Pericarditis in Childhood*

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The relative frequency of purulent pericarditis in childhood, with the infrequency of its recognition and consequent high mortality, has prompted a brief consideration of the subject. Pericarditis is discovered most frequently at the autopsy table. For this reason it is impossible to determine its frequency with any degree of accuracy.

A recent study made at a Boston hospital covering a period of nineteen years showed that acute pericarditis occurred in four per cent. of all autopsies, and that pericarditis is much more common in childhood than in adult life. In 150 autopsies acute pericarditis was found to be present thirty-nine times, or 26 per cent.; seventeen of the thirty-nine cases were in patients under ten years of age. The ages in the purulent type were not mentioned. Pericarditis was diagnosed during life in only one hundred of 34,467 patients treated by able physicians in the wards of the hospital, while during the same period seventy-eight cases were found in 1,553 autopsies. (13)

Suppurative pericarditis in the first month of life occurs most frequently as a part of septic processes. In a series of sixty-six cases in patients under fourteen years of age reported by Baginsky, (19) twenty were purulent and eleven of these occurred in the first year of life. Other statistics (11) show that eighty per cent. occurs in children under four years of age and two-thirds of these are under three years. Still (21) reports twenty-three out of twenty-eight pus cases as occurring within the first three years of life.

ETIOLOGY

Suppurative pericarditis may occur as a direct extension by contiguity, or through the blood. In a great majority of the cases it is secondary to some other focus of infection.

*Read before the Section on Pediatrics of the Medical Society of the State of Pennsylvania, October 7, 1924.

Suppurative pericarditis in children most frequently follows in the wake of the acute infections, especially the exanthematous diseases, scarlet fever, measles, varicella and erysipelas. It may also result from inflammation of the neighboring organs (lungs, pleura, mediastinal glands, thymus gland, esophagus, intestinal canal and bones of the chest); likewise follicular angina, otitis and mastoid disease, osteomyelitis and bone caries, chronic nephritis, peritonitis, meningitis, abscesses of the skin and other pyogenic processes.

The cases which merit most attention are of pneumococcal origin. (11) It has been asserted that ninety per cent. of cases of purulent pericarditis are associated with empyema, pneumonia or pleurisy. In a study made at the Children's Hospital of Philadelphia only fifty per cent. of the cases were so complicated. (19) Brooks and Lippincott (29) found in their 150 cases of pericarditis, pleural lesions in 136. Robert's (5) series of thirty-nine cases revealed a history of some form of infection in either the lungs or the pleura in nineteen cases.

In the previously mentioned 1,553 autopsies (13) of the seventy-eight cases of pericarditis, acute pneumonia or pleuritis was found forty-nine times. Still (21) reports twenty-four cases out of twenty-eight as being associated with empyema or pleurisy.

In the 150 autopsies mentioned above, the thirty-nine cases of purulent pericarditis were complicated by pneumonia twenty times and empyema five times (13). Preble (28) in his series found pericarditis complicating pneumonia in thirty-four per cent.; rheumatism, 28.3 per cent.; chronic diffuse nephritis, 11.2 per cent.; tuberculosis, ten per cent.; sepsis, 4.7 per cent.; aneurysm, 2.6 per cent.; typhoid, 1.7 per cent. of the cases.

Preble (*loc. cit.*) analyzed a series of cases with particular reference to the degree of lung involvement due to pneumonia. When one lobe is involved

the chances of pericarditis are one to forty; two to three lobes, one to nineteen; four lobes, one to five; with pneumonia of the entire left lung, one to eight. He feels that the danger is somewhat greater with a leftsided than with a rightsided pneumonia.

One author has pointed out as a peculiarity of childhood, that pericarditis in the earliest periods of life depends chiefly upon pyemic infection; in middle childhood mainly upon the spread of inflammatory processes; and in later childhood generally upon rheumatic conditions. (24)

BACTERIOLOGY

While the bacteriology of suppurative pericarditis shows the occurrence of staphylococci, streptococci, Frankel's diplococcus, Bacillus pyocyaneus, Bacillus tuberculosis, Bacillus coli communis, Bacillus influenza, rarely Bacillus lactis aerogenes and Bacillus proteus vulgaris, (12) the pneumonococcus is preeminently the organism responsible for the condition in infants. The species of bacteria present, however, in a given case is that of the primary affection.

The pericardium may be infected at a very early stage of the primary disease, or as a terminal event. The effusion may be fibrinous, serous or purulent. A dry pericarditis of one day may be a pericarditis with effusion the next. The amount of fibrin in an exudate will vary greatly. Often there is only sufficient to coat the pericardium. At other times it is so abundant that the heart is covered with a plastic layer which may be as much as a centimetre in thickness. (7) It has been stated that the exudate in early life is usually purulent, in middle childhood serofibrinous, and later almost always purely fibrinous. (24) When pericarditis is due to the pneumococcus the pus is generally less abundant, thick and creamy; the two layers of the pericardium being completely covered with an envelope of thick, dark-yellowish fibrin. (1) When streptococcic, this liquid is, on the contrary, abundant, purulent, with the membrane only slightly thickened. (1) Large effusions are more apt to be serous. (1)

In pericarditis the myocardium is often attacked. (8) Indeed one of the earliest results of pericarditis is dilatation of the heart. As the visceral layer of the pericardium sends a fibrous meshwork carrying blood and lymph vessels into the myocardium, the inflammation is carried into the muscular wall. With every pericarditis, therefore, must be more or less myocarditis (22) and consequent cardiac weakness. Finally, it is not unusual to find inflammation of the mediastinum and pleura as well as bronchial and pulmonary complications.

SYMPTOMS

In the very young all the usual symptoms one expects to find may be absent. The temperature may be normal or subnormal. There may be no indications of the presence of cardiac disease or other abnormal physical signs. For these reasons some excuse may be made for failure to recognize the affection during life. (19) These facts emphasize the importance of a thorough physical examination at each visit, with complete notes and charts. Location lines may be left for comparison at the next visit. Aside from the fact that examination of the heart in the young is attended with many difficulties, there is scarcely another disease which presents as variable a picture as does pericarditis. (22)

The symptoms in a given case depend largely upon the pathology present. It is well to keep in mind these changes and the resultant physical findings. These (22) will include alterations in the surface of the pericardium, the presence of fluid exudate and changes in the condition of the heart muscle.

The history will usually reveal that the child has recently suffered from some acute infectious process, associated with fever, rapid pulse, dyspnea, restlessness, possibly cough and precordial, epigastric or abdominal pain. (20)

In cases with moderate effusion, palpitation, dyspnea and acceleration of the respiratory rhythm do not usually occur. (8) The pulse is usually rapid, but remains regular. (8) With increasing effusion, dyspnea, orthopnea, cyanosis, rapid, irregular and intermittent action of the heart develop. (22) In septic cases there may be in addition high fever and profuse sweating. (7) When effusion occurs the pain becomes less or may disappear entirely. (22)

DIAGNOSIS

As already intimated, the diagnosis in children is not the simple procedure one would ordinarily suppose. The reverse is a fact and there is no other grave malady so frequently discovered for the first time postmortem. (7) It is most important, therefore, to remember this fact and not make the mistake of attributing any suggestive symptoms to the already known conditions. (13, 4, 7, 1)

While in most cases acute pericarditis is a rapid process, in some cases the onset is insidious. Occasionally cases occur which run a mild course in the beginning, grave symptoms develop suddenly with dangerous complications. (22)

The apex beat in exudative pericarditis of children, may move to various points within the area of dullness, by change of the child's condition, if the heart has not lost its motility in the pericardial sac. (24) When the child bends forward or is placed in the knee chest position, the apex beat which previously may have been absent may reappear. (22, 24) With small effusions there is little change in the force or position of the cardiac impulse or in the intensity of the heart sounds. In larger effusions the apex beat may be higher up and farther to the right, even in the fourth space near the sternum, the explanation being that the effusion allows only the front of the ventricle to strike the chest wall. The impulse may disappear to inspection, but still be palpable. (23) In extensive effusion the impulse is usually neither visible nor palpable, the heart sounds being very feeble or completely absent except at the base. Diminution in the intensity of the heart sound is not accompanied by a corresponding weakening of the radial pulse—an important point in diagnosis. (23)

Obliteration of the intercostal spaces and even bulging of the precordia, with immobility, may result when effusion develops in sufficient amount. (23) In these cases there will be an increase in the area of cardiac dullness, an enfeebled or lost apex beat and auscultatory sounds. The pulse rate is considerably accelerated, sometimes reaching 150-180 to

the minute, in small children. (24) In most cases of large pericardial effusion one finds some modification of the voice and breath sounds, either intensification or diminution, below and internal to the angle of the scapula. (13)

FRICTION

Friction rubs may be constant, intermittent or absent. One writer (27) believes that they are present in every case some time in its course, and that systematic examination will reveal them. Others believe that they are exceptional (33) and that pericarditis can develop and go on to effusion without the characteristic friction rub being detected except by the closest and most frequently repeated observation. The friction murmur varies in character, depending upon the age and physical character of the exudate. (24) The friction, when present, may be evident to both palpation and auscultation. (20)

If present it is usually loudest at the base of the heart, and changes in intensity with change in position or pressure with the stethoscope. (3, 24) It becomes louder when the child sits up, walks or bends forward, or when pressure is made with the stethoscope, and more feeble when the child lies on its back. (24) As the pericardial surfaces are kept separated with larger effusions, the friction usually disappears, and a decided increase in the area of dullness is observed. (24) A friction murmur, when present, accompanies one phase of the cardiac cycle. It may be systolic or diastolic or have a three beat rhythm—due in part to change of position of the patient. In infants and young children the recognition of the friction rub is difficult and often impossible, on account of the rapid action of the heart, (23) and it may be mistaken for a valve murmur. The rub may move from day to day, and disappears with resolution or the formation of fluid. The effusion may be so extensive that it fills the entire left chest, pushing up the lung and giving the same signs as pleural effusion. (23)

The disposition of the effusion with relation to the heart itself is of importance. The conception that the fluid in pericarditis is evenly distributed about the heart is certainly not correct. The fluid tends to accumulate in the lowermost part of the sac. With the patient in the supine position, the fluid would accumulate in the posterior part, and the anterior surface be but scantily covered. If it is possible to put the patient in the knee chest position, an increasing cardiac dullness can be noted. (7) A recent study by Williamson (15) shows that fluid first accumulates along the lower margin of the heart about the apex, and next over the great vessels at the base. The result in the first instance is to push the left lobe of the liver downward, and the second result is a retrosternal dullness—both of which constitute important signs. Studies were made by Rotch, (37) as a result of which he concluded that the obliteration of the cardiohepatic angle was a conclusive sign of pericardial effusion. While this sign is still quoted, it is our impression that it lacks the importance attributed to it by Rotch.

In respect to diagnostic symptoms in the presence of effusions, one general statement may be made, viz., the more rapid the development of the effusion, the more severe are the symptoms likely to be. In other words, a large effusion which has taken some little time to form, so that the heart and lungs have had time to adjust themselves, may be attended with much less distress than a much smaller effusion which has formed rapidly and has not given so much time for compensation. (1)

The cardinal diagnostic points which are usually set down are: (30) 1, Increase in the cardiohepatic angle; 2, increasing faintness of the cardiac sounds; 3, disappearance of cardiac impulse; 4, pulsus paradoxus. The latter may occur in other conditions and even in normal subjects. (3)

In determining increase in the area of cardiac dullness, it is important to remember that the apex beat is, as a rule, outside the mammary line until the fourth year; from the fourth to the ninth year in or near the mammary line; after the thirteenth year, under normal conditions, it is invariably within the line. (20) Normally cardiac dullness extends from one quarter inch beyond the right margin of the sternum, to the left vertical nipple line, and in very young children one quarter inch beyond. (20)

In moderate effusions there is slight absolute dullness in the fourth right interspace, more marked absolute dullness in the fifth interspace, an obtuse cardiohepatic angle, and enlargement of the precordial dullness to the left. (23) This area of dullness is usually triangular, with the base below, (23) and has been described as a bag filled with water set down on a table. (3) The larger the effusion, the farther does the area of precordial dullness extend, both to the right and to the left. (23) In very large effusions the area of dullness is rather circular, the cardiohepatic angle again becoming acute. (3) A progressive increase in cardiac dullness constitutes the most reliable evidence of a pericardial effusion. (7) Daily noting this broadening area of dullness, one will appreciate more forcibly the dullness in the cardiohepatic angle; and the fact that while the cardiac dullness is increased in all directions, the greatest increase is along the base line. (23) As a collateral sign of pericardial effusion, Pins of Vienna long ago pointed out evidences of pressure exerted upon the lower left lobe of the lung. (7) Almost all authors (Billings (27), Babcock (30), Cabot (32), Parkinson (35)), call attention to this small area of dullness in the left back, just inside the angle of the scapula, as described by Ewart, and produced by the mechanical atelectasis of the compressed lung. (3) Ewart (25) describes this patch of marked dullness present in pericardial effusion, as extending from the spine outward not quite so far as the scapular angle line and ceasing with its vertical outward boundary extending upward to the ninth or tenth rib and for a short distance to the right of the spinal vertebræ. Rarely, however, is this sign determined with the exactness laid down by Ewart's boundaries, (7) and as a partial consolidation of the lung or of a pleural effusion, as well as compression of the lung by the distended pericardium, may account for them. (7) Ewart's explanation (26) is interesting but not conclusive.

DIFFERENTIAL DIAGNOSIS

It may be well to point out a few of the difficulties which confront us in the individual case. Considering the intimate contact of the pericardium with

almost all the structures of the thorax, it is not remarkable that pericarditis may be mistaken for other affections of the thoracic or abdominal viscera. (3)

ENLARGED HEART

The enlarged heart will give an increase in the area of dullness both to the right and to the left. The left limit of precordial dullness corresponds to the apex beat or extends a little beyond, while in pericardial effusion the dullness usually extends notably beyond the apex beat. (23) Also in enlarged heart the cardiohepatic angle is acute, while in small and moderate effusions in the pericardium, it may be obtuse. (23) The area of dullness and bronchial breathing referred to as occurring in the back on the left side is almost never caused by enlarged heart alone. (23) As regards cardiac hypertrophy, this may be surmised with fair accurateness by inspection and palpation, suggestive signs being: a large area of pulsation and possible precordial bulging, increased dullness to the right with a diastolic thrust in the epigastrium, pointing to rightsided hypertrophy, and a large area of cardiac dullness to the left; a systolic thrust of the apex well outside the nipple line, suggesting left ventricular hypertrophy. (20)

Dilatation of the heart may give rise to enlargement similar to that of effusion, but this being enlargement of either right or left ventricle, has not the symmetrical enlargement of pericardial effusion. (7) A cardiac dilatation may be sudden, progressive and extreme, especially that of the right side of the heart. The dullness may extend from the right nipple to two or three inches outside the left nipple line, thus simulating pericardial effusion, and to be differentiated with difficulty.

DULLNESS

Both Gibson's notch and Rotch's notch acquired their chief importance from the result of experimental injections into the pericardium. These are now believed to be of little practical value. (1) As regards cardiac dullness in the presence of effusion, three particular signs have been pointed out, all of which have been questioned by various authors. The first of these is described as an increase in cardiac dullness, outwards and upwards on the left side along the third space or rib. (1) This leads to the disappearance of the cardiomediastinal notch described by Gibson and named after after him—Gibson's notch. This condition is often seen in pericarditis without effusion, or other forms of heart disease, where no pericarditis exists at all, possibly being due to a dilatation of the left auricle. (1) Rotch (*loc. cit.*) called attention to increasing dullness in the fifth and sixth interspaces on the right, with increasing effusion. This results in a disappearance of the cardiohepatic notch on the right side known as Rotch's notch or angle, and was formerly regarded as an early sign of effusion. (23) Williamson (23) was unable to demonstrate Rotch's sign or that the position of the patient influenced the character of the cardiac dullness. (1) The third sign, that of Ewart, has already been described.

It is from dilatation of the heart particularly that pericardial effusion must be distinguished (10). With dilatation the impulse can usually be made out as far as the dullness extends at the apex (1). While the epigastrium may be prominent in both cases, in pericardial effusion there is often epigastric recession; in dilatation there is mostly systolic protrusion (1).

Pleuritic effusion.—A large pericardial effusion in which the precordial dullness on the left merges with the dullness in the left back, may be mistaken for pleurisy (23). Pleurisy of the left base is common in pericarditis (20). When pericardial effusion occurs in association with pleuritic effusion, as often happens in empyema, the recognition of the former is still more difficult, unless a typical pericardial friction rub be present (23). Likewise a massive pericardial effusion considerably compressing the left lung might be mistaken for a pleural effusion if sufficient stress were not laid upon the position of the apex beat of the heart, which is shoved to the right side with pleurisy and is absent with pericarditis (24).

Empyema.—In the presence of most cases of empyema, purulent pericarditis is not diagnosed, either because the symptoms are masked or because there are no definite cardiac symptoms at all (1). In others, a diagnosis of leftsided empyema may be made, and on opening the side, after finding or not finding pus in the pleura, the pericardial sac may be felt bulging, and incision through the pleural opening shows it to contain pus (1). The important points in pericardial effusion are absolute dullness in the fifth right interspace with an obtuse cardiohepatic angle when the empyema is on the left; extension of the dullness to the left, notably beyond the apex beat, when the empyema is on the right side; and weak impulse with faint heart sounds. Of course, a typical pericardial friction rub is the greatest aid in the recognition of these cases, but this is often absent and pericardial effusion complicating empyema is frequently overlooked (23).

Likewise a leftsided empyema may produce cardiac dullness to the right and obscure the limits of cardiac dullness to the left (7). In a similar manner a pleural effusion on the right, a pneumonia, an enlarged liver, abdominal distention, displacing the liver and diaphragm upwards, or still more commonly the noisy respiration or restlessness of an extremely sick child, may make observation difficult or misleading (7). It may be distinguished from an enlarged liver by the faintness of the heart sounds and the disappearance of the cardiac impulse (3).

Loss of abdominal respiratory movement has already been mentioned as an accompaniment of pericarditis, often preceding and surviving the friction sound (16). Wynter (*loc. cit.*) reports a case in which remarkable stillness of the abdomen led to a diagnosis of an acute abdominal condition, which later proved to be pericarditis. Purulent pericarditis, particularly following measles, whooping cough and influenza, frequently passes unobserved, except when friction occurs, or in the presence of a large effusion (11).

Gibson (23) found pain in seventy per cent. of cases; Sears in sixty-five out of one hundred cases (3). Babcock (30) found pain in a majority of his cases, and if pain was absent there was a sense of distress. In Robey's (3) series of seventy-eight

cases, pain was present twenty-six times. Of these twenty-six patients, seventeen had either pneumonia or pleurisy and only six had pain directly over the precordia. In two purulent cases operated upon, pain was never present (3). While opinions differ, the most generally accepted is that the majority of cases do not have much pain (2, 3).

X ray evidence.—Williams in experimental studies reported in 1903, states that the signs in pericardial effusion differ with the amount of fluid present. The larger amount increases the shadow of the cardiac area and the heart shadow becomes more rounded. In small effusions, it should be remembered that the fluid is largely in the most dependent part of the pericardial sac.

Holmes (14) states that the shadow of the dilated heart resembles very closely that of pericarditis with effusion. The heart shadow is rounded and there is no change in position of the patient.

Comparing röntgenograms of pericardial effusion with those of dilated hearts, the line in the latter is almost always a curve inward as it nears the liver.

The x ray findings in pericarditis with effusion may be summed up as follows (36):

1. Heart globular in shape and enlarged symmetrically, with widened base.
2. Heart shadow larger in the recumbent posture than in the vertical posture.
3. Diminished impulse of the heart under fluoroscopic examinations. This is due to sac fluid.
4. The obliteration of the costocardiac angle, due to fluid in the pericardial sac, is unreliable, as conditions of the pleura and lungs involving that region simulate distention and enlargement of the heart.

Finally we believe the x ray to be a valuable aid in the diagnosis of pericarditis in children; only, however, when studied in connection with the physical findings. It aids in pointing out complications.

PROGNOSIS

Purulent pericarditis in children, whether due to the pneumonococcus, streptococcus, or some other organism, is usually fatal (11). It is practically always a fatal complication in infants (23). In many cases of latent purulent pericarditis, death is sudden. This is due to cardiac syncope, the result of the myocardial changes which are more extreme with purulent than with other forms of pericarditis. The pneumococcic type is one of the causes of sudden death in pneumonia (1). The quantity of exudate has a definite relation to the prognosis (7). Studies indicate that whatever the nature of the pericardial effusion, if it be accompanied by low blood pressure and weak, irregular heart action, the pressure within the pericardial sac should be lowered by aspiration or drainage (4).

TREATMENT

The only form of treatment holding out any hope for cure in purulent pericarditis is surgical incision and drainage. In Elliott's table (4) of twenty-two cases of suppurative pericarditis treated by operation in seven of which the patients were under sixteen years of age, only one recovered. The prospect of a cure after operation is much more favorable where the infection is limited to the pericardial sac than where the pericarditis is part of a general sepsis (4). That occasional recoveries are secured in this latter group, however, warrants surgical interference where the patient is not moribund (4).

(*To be concluded*)

Atypical Influenza in Children

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The subject of atypical influenza in children is particularly timely for the reason that, although unaccompanied by the usual newspaper publicity, there has been a definite epidemic of influenza among children during the past three months. As a matter of fact, since the last great pandemic of epidemic influenza in the United States in 1918, there have undoubtedly been recurrences during the last few years, occurring especially from December to March.

The various epidemics have, however, been characterized by certain peculiarities with regard to type and localization as well as to virulence. For instance, during 1921, a great majority of the cases showed ear infections of marked severity with considerable mastoid involvement. Purulent otitis media was common; mastoid operations were frequent. In last year's series there were many cases of otitis media, mastoiditis was comparatively rare, and respiratory complications were markedly in evidence.

I am basing this discussion of atypical influenza in children or, as it may be termed, the present epidemic of influenza among children, upon a study of about three hundred cases seen in private and consultation practice during the last three months. But before proceeding with this discussion, let me summarize briefly, the various types of influenza which we have encountered during the last two years, types which are fairly definite in their clinical and physical syndromes and types which unless considered as such are often mistaken for, and classed as, definite clinical entities depending upon the predominant complications present.

We may recognize at least six distinct types of influenza, as follows:

1. The type usually referred to as the grippe, more specifically the nasopharyngeal type, with coryza, a thin mucous nasal discharge, sneezing, conjunctivitis, and a red congested throat involving the tonsils and the pharynx. The temperature varies between 100° and 104°. There is a poor appetite which occurs early in the onset and continues throughout the course of the disease. After a comparatively short period there appear an extreme loss of weight and strength entirely out of propor-

tion to the apparent illness. The chest and abdomen are negative. It is this type which is particularly prone to several relapses before complete recovery takes place.

2. This type is marked by congestion of the upper respiratory tract and especially by a tracheitis, showing in addition to the above named symptoms a progressive hoarseness and a dry paroxysmal cough simulating whooping cough. This last condition is particularly intractable to treatment and constitutes an especially disturbing factor, delaying the ultimate recovery of the child.

3. In this type the symptoms start with a coryza involving the throat and mucous membranes as described above, but within a short time, a bronchitis involving the smaller tubules of the lung occurs, with a bronchopneumonia developing shortly thereafter. The peculiar edematous throat persists for some time after the pulmonary involvement has subsided and the cough remains dry and irritating. The course of the disease is apt to be rather protracted, with signs of physical exhaustion and toxemia on the part of the patient.

4. The intestinal symptoms are predominant in this type. Beginning as in the first class, severe constipation with cramps and distention, or diarrhea with watery mucous stools containing undigested food and often streaked with blood, soon occurs.

5. This is the nervous type which is the most serious form, but fortunately occurs least frequently. It may involve either the brain or the general nervous system or both. It is marked by extreme irritability, headaches, pains in the muscles and limbs, convulsions, stupor, coma and retraction of the head, and is apt to run a course of high temperature with rapid pulse. Of all the types, this is the one most likely to end fatally.

6. There may be combinations of two or more of the aforementioned types.

During the present epidemic, I have been much impressed with certain clinical observations that have occurred over and over again. The child runs a temperature for a day or two, has a running nose, with a thin mucoid discharge, loses its appetite and, on examination, shows merely a red throat, with or without congested ear drums, although the landmarks of the drum are easily made out and the light reflex is present. A day or two later, with a persistence of the red throat and the otitis, a cough develops. The temperature is generally fluctuating, perhaps between 100° and 104°. It has been my experience that the otitis, if one compares the incidence of purulent otitis and mastoiditis in previous epidemics, does not often develop into the purulent type. Bronchopneumonias, contrary to our experiences of last year, have been comparatively few as a result of a grippe infection. In some cases there is pulmonary congestion with localized dullness on percussion, but the picture of a definite bronchopneumonia, both clinically and on physical examination, is not present. Moreover, these symptoms are often both migratory and transitory, spreading from place to place in the chest and lasting for perhaps two or three days. In some cases they are, however, quite protracted, although the general effect upon the patient is not as severe as one might be led to expect. In a good many children, the urine examination shows traces of kidney irritation, such as the presence of albumin and an occasional cast or pus cell. Acetone is generally present, and the urine presents a high specific gravity with a strongly acid reaction. The blood examination generally shows a moderate increase in leucocytes. Throat cultures taken on the ordinary broth or agar medium, although showing the presence of many organisms, rarely exhibit a growth of the influenza bacillus. These are found chiefly in the lower respiratory tract, less often in the nasopharynx, and rarely in the ear discharges. They can, however, be demonstrated by obtaining a specimen of the mucopurulent discharge raised by the child when gagging or coughing, and when immediately grown upon a blood agar plate, for the influenza bacillus belongs to the hemoglobinophilic group. There generally are found in these cultures contaminating strains of streptococci either of the hemolyticus or viridans type, the staphylococcus and the pneumococcus.

Some children show a cervical adenitis and although accompanied by an elevation of temperature, fluctuating in nature, we cannot but be impressed with the fact that here again, few cases advance to suppuration which necessitates opening the abscess.

Some patients show the presence of a rash or a scarlatinaform erythema accompanying this condition, which is often mistaken for scarlet fever, especially in view of the ever present coryza and the red grippal throat. However, this rash is characterized by a rather abrupt appearance and by a certain transience, as it disappears within twenty-four hours or lasts possibly two or three days at the most. It is red, of irregular distribution, rather macular in character, without elevation to the touch, appearing particularly on the front of the body, less often on the extremities, and leaves no residual staining on disappearance. These patients do not desquamate as a rule and certainly not upon the palms of the hands nor the soles of the feet, as in scarlet fever. And where there is desquamation, it has been of the fine branlike type. The differential diagnosis depends upon a careful consideration of the mode of onset, upon the symptoms in general, and upon the character of the eruption itself.

We have seen some children who show symptoms of an acute cholangitis with marked jaundice and considerable tenderness over the liver. This complication is most apt to occur in the gastrointestinal type.

In children who have large tonsils and adenoids one often sees an attack of influenza running a rather protracted temperature course, with one or both ear drums congested, which do not go on to suppuration. There apparently are no other localizations or complications present. Upon careful examination, one will often find a sinus involvement, which is apt to be overlooked, unless this complication is considered as a possible explanation of a long drawn out illness and particularly of the continued high temperature.

In infants, the course of influenza is likely to be mild, even though they have no individual immunity to the disease. For that reason, it is not necessary to stop nursing breastfed babies should

the mother have a mild type of influenza. However, this precaution should be taken when the disease assumes a serious aspect.

An attack of influenza, per se, confers very little or no immunity, hence recurrences or frequent relapses are quite common. In fact, one often meets with a type where the temperature reaches normal within a few days after the onset, only to rise again and to assume a fluctuating character within twenty-four hours, with evidences of characteristics similar to the first attack. This may repeat itself several times before the ultimate subsidence of the disease. A characteristic of the type met with during this epidemic is the generally low virulence, and while one occasionally sees a case of severe virulence, it would seem that the contaminating strain of streptococcus, staphylococcus, or pneumococcus is responsible for this increased virulence. It is also true that the influenza bacillus itself is likely to gain in virulence by successive passage through various hosts.

TREATMENT

Heretofore, it was the usual custom to prescribe antipyretics as a routine procedure in influenza. In fact, aspirin and phenacetin and salol were considered almost specific. In the present epidemic, I have entirely discarded the use of these drugs. They have had little or no effect in my hands upon the course of the disease and neither have they affected the possibility or probability of the complications mentioned above. Acting as antipyretics they would reduce the temperature and perhaps thereby make the child more comfortable, but when one considers that the temperature is fluctuating, that the high temperature is generally of short duration, and that the effect of antipyretics in general is not a wholesome one upon infants or children, my reasons for discarding them should be apparent. The drop in temperature, the reason for which is rarely understood by the parents, gives the mother a false sense of security and nullifies, in a measure, all our efforts at control of the child to prevent the possible development of untoward complications. And of what value is the temporary reduction in temperature? For upon withdrawal of the medication, the temperature promptly rises, only to continue as before. Children bear temperature changes very well, and a sponge bath with alcohol, or a tepid bath, seems to be sufficient to control the effect of high temperature. Rarely, if ever, in influenza does a cold pack have to be resorted to. The patient should be kept in bed during the entire time of the illness, and for at least forty-eight hours after the temperature has entirely subsided without any fluctuations or evening rise. This will tend toward complete recovery and lessens the probability of a relapse.

Fresh air and a liberal amount of water should be allowed. Laxatives should be used when indicated. I prefer milk of magnesia administered either plain or in the milk feedings, because of its alkalinity and because its action is comparatively mild and without the griping effect of other cathartics.

The complications should be treated as they arise. I have previously mentioned the frequent occurrence of acidosis as an accompaniment of this disease, and have found nothing better than the early administration of alkaline treatment using the potassium citrate or acetate and bicarbonate of soda in doses of ten to thirty grains three times a day. In children showing gastric or intestinal symptoms, where the distention is marked, great relief is experienced from the daily use of high colonic irrigations with bicarbonate of soda, one dram to the glass using two to four glasses or even more at a time. I am inclined to advise this as a routine measure beginning early in the disease.

COMPLICATIONS

In discussing the complications during this epidemic, it has already been stated that the necessity for operative intervention for purulent otitis media is comparatively infrequent, and I must strongly condemn the unscrupulous attitude of some otologists who, for reasons best known to themselves, frequently do a paracentesis without taking this fact into proper consideration. The few in which operative measures are necessary subside soon after incising the drum and mastoiditis as a complication has been met with rather infrequently. I might call attention here to the fact that in children running high temperature with accompanying otitis, possibly purulent, the incision of the drum and the establishment of proper drainage is often not followed by a drop in temperature as one might expect. The temperature continues to fluctuate because, as a matter of fact, the otitis media is merely an incident in the general infection and it is the latter which governs the continuation of the general clinical picture. During this epidemic I have used as a routine measure early in the disease, a solution of adrenalin chloride, one to one thousand, one dram to the ounce of distilled water, using five drops three times a day in each nostril, in the belief that the reddened ear drums are due to a congestion of the Eustachian tubes which are rendered patent by the use of the adrenalin. In cases where this solution has been used, the otitis has, in my experience, been very mild in character and rarely, if ever, has it been followed by a purulent condition. One should not use this solution too frequently and as a further precaution should discontinue its use after five days, to resume it again, if necessary, two days later.

In children with enlarged tonsils and adenoids, the course, particularly as to temperature, is often a protracted one. Severe frontal headaches often accompany it, with a thick mucoid nasal discharge and with swollen tonsils much congested, but rarely of a follicular type. Here one should be on the lookout for sinusitis, and if found, the use of a suction apparatus applied to the nostrils will often result in a gradual drop in temperature and a lessening of the nasal discharge, and will hasten the ultimate recovery.

One of the most distressing complications which we have met with during this epidemic is a peculiar paroxysmal cough occurring with the tracheitis and pharyngitis. This cough is at times so spasmodic and explosive as to suggest the possibility of whooping cough or the presence of a foreign body. The cough is persistent and resistant to all forms of treatment. Sedative expectorants, medicated

vapor inhalations and antispasmodics are of no avail. Codeine may have to be resorted to in liberal doses. Cocaine solutions of one half of one per cent. have been used, applied locally to the retropharynx. A change of air to a warmer climate may act as an ultimate cure. In some of these cases, there is seen a severe edema affecting the entire pharynx and particularly the uvula which becomes swollen and elongated, so much so as to act as a foreign body. I offer this as a possible explanation for some of these intractable persistent coughs.

DIET

Contrary to the old method of reduced diet in all febrile conditions in children, we are leaning toward the belief that feeding these children liberally, using plenty of cereals, vegetables, milk and fruit juices, with plenty of water, increases the vitality and resistance and lessens the tendency to further complications. Particularly is this true where acidosis is present and where vomiting is frequently a disturbing factor. These children will often retain thick cereal gruels where they would be likely to vomit liquids in general. This in combination with the colonic irrigations and the alkaline treatment should afford early relief. We have not yet reached the point where we are to include proteids such as meats, eggs, or even Jello, in the diet.

CONCLUSION

In conclusion, I might add that children with influenza should be isolated, and as a further precautionary measure no operations, even of a trivial nature, should be undertaken during this period if they can possibly be delayed for a more opportune time. Furthermore, the mortality reports for this epidemic are very low, and recovery is the rule, for the disease is, to a great extent, self limited.

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Röntgen Studies and Treatment of Enlarged Thymus in Children*

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The thymus gland in children presents an interesting subject for clinical and x ray exploration; for its enlargement may be accompanied by dangerous symptoms. The fact that children may have an enlarged thymus which is not accompanied by its characteristic symptoms of stridor, cyanosis, asthma and respiratory difficulties, is fraught with grave consequences, especially when operative proceedings are contemplated; for such patients are prone to sudden death under an anesthetic. "It is well proved by a long series of cases, carefully studied, by competent observers that the condition known as status lymphaticus is an entity, which is characterized clinically by a lowered vitality or unstable equilibrium of vital forces, so that accidents or disturbances otherwise unimportant, such as some slight injury or a light anesthesia may precipitate a failure of the heart or respiration. That T and A subjects are prone to enlarged general lymphatic structures, such as the thymus, is well known, especially at an age when it should have disappeared. Many of the sudden deaths due to chloroform and ether have proved to be due to an enlarged thymus (1).

Many children with enlarged tonsils are now operated upon and every now and then we hear of a sudden death without apparent cause, but when a postmortem examination has been made, an enlarged thymus is revealed. This condition is especially grave for the reason that these little patients have not presented previous clinical symptoms of a hypertrophied gland. That the life of an apparently normal child can be suddenly snuffed out without known cause is certainly alarming and of grave professional consequences.

Gwathmey (2) in his recent book states: "In extremely rare and unusual cases of status lymphaticus, the organs may be diseased and anomalous, it is quite conceivable that the heart may be paralyzed before respiration ceases. When paralysis occurs, from the condition it is usually in primary anesthesia. Until recently it has been the custom to give chloroform to children and a number of deaths have been reported of children dying two to three days after its administration and postmortem revealed that the children had what is known as status lymphaticus.

The clinical evidences of this condition do not warrant its certain detection beforehand, but the anesthetist will be wise to be particularly on his guard when the patient is a child or a young adult of slight physique, pale complexion or with large tonsils and adenoids. A majority of writers agree that a positive diagnosis during life is difficult. Cocks considers an x ray examination second only to the general condition of the patient in making a diagnosis. Halstead points out the great danger of operation for adenoid and tonsils upon children with status lymphaticus, on account of the great shock with fright and violent struggles, which in some cases produce death.

The association of sudden death with thymic enlargement is not new, for 250 years ago the investigations of Morgagni proved it was possible. Lee in 1842 and Howland in 1907 refer to sudden death due to laryngeal spasm and asthma in children.

Congenital enlargement of the heart with its attending clinical symptoms of stridor and cyanosis has been at times confused with thymic enlargement, and it is only by x ray exploration of the chest that a differential diagnosis can be made between the two diseases.

The x ray investigation of the chest in infants and children presents many differences, such as enlarged mediastinal shadow, small area of the lungs, and

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Fig. 1, A.—Normal heart and thymus in an infant aged three months.

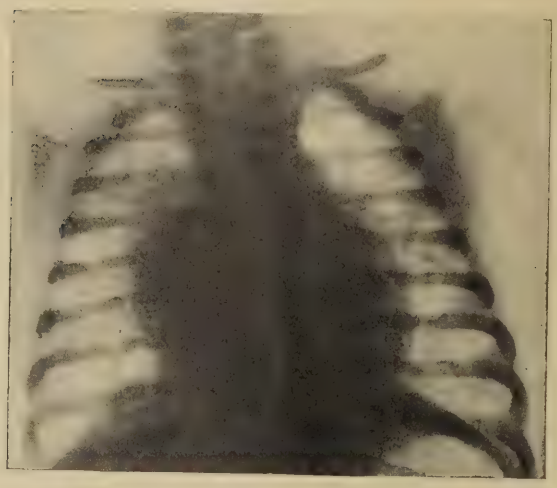

Fig. 2.—Congenital heart in an infant aged three months. Note narrow base of the heart. This patient had marked cyanosis and stridor with respiratory difficulties and the case was mistaken for one of an enlarged thymus before an x ray examination was made.

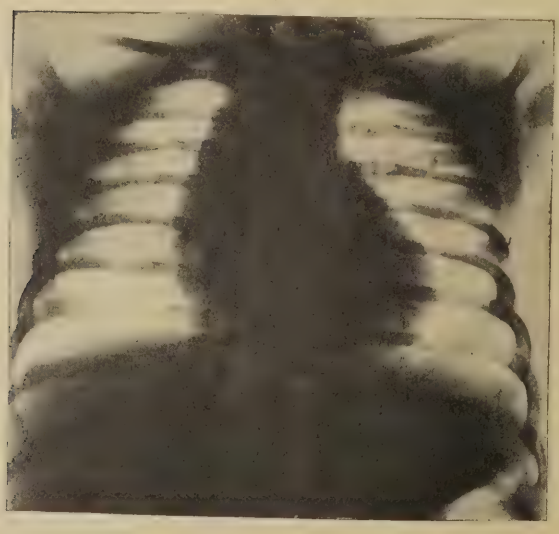

Fig. 3, A.—Illustrates normal heart and thymus in a child aged three years.

narrowness of the ribs. The technical difficulties are many, the most important of which is the inability of having cooperation of the patient. It is necessary to make the exposures as soon as possible—when you can get them—on either respiratory impulse. A plate taken at six feet (teleoröntgenographic) is

Fig. 1, B.—Hypertrophied thymus gland in an infant aged eight months; arrows point to enlarged gland.

always advantageous in procuring a less distorted view of the anatomy. It is expert work to get good diagnostic chest röntgenographs of infants and children and it often requires great patience, tact and quick work on the part of the technician, a feature of röntgenology which is not often appreciated by the physician not doing x ray work.

In newborn infants and young children with cya-

Fig. 3, B.—Enlarged thymus in a child aged three years. Note difference in the base of the heart, and continuous shadow upwards.

nosis and respiratory difficulties, an enlarged or persistent thymus should always be considered. The röntgen examination of the chest may not only show an enlarged thymus, but it will likewise give clue to the pathology in the heart or lungs. The diagnosis of thymic enlargement is not free from possible

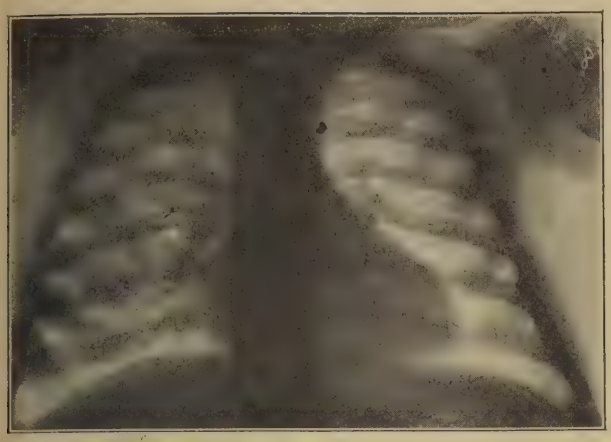

Fig. 4.—Patient had a low placed enlarged thymus which did not show in the x ray examination. This patient was operated upon and died in the primary stage of anesthesia.

error, for the enlarged gland may be placed so low over the heart that the two organs are apparently fused and the x ray will not demonstrate a mediastinal smooth bulging silhouette at the base of the heart characteristic of an enlarged gland. The film may show also a large shadow at the base of the heart during expiration but not on inspiration.

In recent investigations E. T. Evans, (3) Boston, states that the persistence of the thymus gland as a relatively normal condition has been demonstrated, although a positive x ray is not always in evidence, but secession of the symptoms are frequently noted after x ray treatment. Many sudden deaths of children formerly supposed to be due to bronchopneumonia, congenital anomaly of the heart or acute intestinal indigestion, in which autopsies have given little information of the cause of death, may have been due to unrecognized thymic hypertrophy. Such types of cases have recently been examined, considering the possibility of thymic enlargement in spite of a possible negative x ray, treated as such, with the röntgen ray with accompanying happy results and the disappearance of the cyanosis and dyspnea. The presence of an enlarged thymus in older children as compared with the newborn and infants is not as dominant, however, a sufficient number of older children do possess this pathological state, that a rigid clinical and x ray examination should be made before operative procedure, a possible collapse and a sudden death may by this means be forestalled.

Fig. 5.—Shows anterior and posterior view of the postmortem findings of the patient shown in Fig. 6. A very large thymus, which weighed thirty-nine grams, was situated so low over the cardiac shadows it was impossible to see in the röntgenograph.

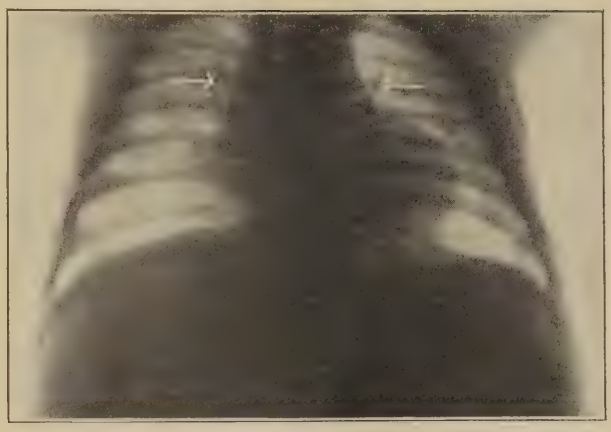

Fig. 6, A.—Enlarged thymus in an infant six months old.

Recently in a series of 237 T and A patients at the Seaside Hospital, ten definite cases of thymic enlargement were found and eight cases with a suspicious broadening of the base of the heart were observed. The patients' ages ranged from a few months to twelve years. In the positive cases the patients were not operated upon and those who remained in the hospital were treated by x ray for the enlargement. One patient died suddenly under primary anesthesia, who röntgenographically and clinically did not show an enlarged thymic shadow. The subsequent postmortem examination proved that the hypertrophied thymus was lying low over the heart, therefore in the x ray the silhouette could not be visualized by the examination, because the two shadows were fused. The thymus in this patient weighed thirty-nine gm. This thymus in the x ray did not show, however, the exception in this case does not prove the rule.

Many broad chested children under three years

Fig. 6, B.—Shows reduction of the gland after one x ray treatment.

of age as a rule show a wider base of the heart. This broad base should not be confused with thymic hypertrophy, unless other clinical signs should warrant a diagnosis. In over 500 cardiac examinations of children and infants at the Seaside Hospital, we

have observed the above normal appearance. The x ray examination of the chest may differentiate between a negative and positive thymus, depending to the extent of the bulging shadow at the base of the heart, either to the right or left of the median line.

It is not our experience with many hundreds of chest and cardiac examinations during the past three years, that an enlarged thymus exists as often as asserted by some authorities. In a series of 237 T and A cases, children of all ages, a positive thymus was found in ten patients. The treatment of thymus enlargement was formerly by surgery, but the mortality was so high that the surgical treatment has been superseded by x ray treatment, which is safe and satisfactory in the majority of patients.

This paper has been largely the result of ideas entertained as the result of the unfortunate outcome of treatment in the patient, whose history I shall now describe:

CASE.—R. H., four years, admitted at the Seaside Hospital Orthopedic Service on August 5, 1924. Physical examination revealed pale, poorly nourished child with rachitis. Patient was built up and gained two pounds in the hospital. The x ray examination of the thymic region was negative. Three weeks later the patient was prepared for operation, to correct the knock knees and anterior bowing of the tibia. While under primary anesthesia, the patient suddenly ceased breathing without warning, and all efforts to resuscitate the patient were unavailing.

Postmortem findings: The gland was enormously enlarged, weighing thirty-nine gm. It extended downwards two thirds over the pericardium. A general hyperplasia of the glands of the mesentery was also noted. The enlarged gland was so low over the pericardium, that the shadow could not be differentiated from the heart in the x ray examination.

SUMMARY

1. All children before operative procedure should be studied both clinically and by means of x ray for enlarged thymus.

2. Sudden death without previous clinical symptoms may result as the result of primary anesthesia or mild shock to the system.

3. Congenital anomaly of the heart and thymic hypertrophy can be differentiated by röntgen examination, although the symptoms may simulate one another.

4. All children under three years present a broad base of the heart, which should not be confused with an enlarged thymus.

5. An enlarged thymus gland may be placed so low over the pericardium, that it will not cast a characteristic shadow, when examined by means of the röntgen ray.

6. The x ray presents a satisfactory method of treatment of enlarged thymus gland.

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Meningococcal Meningitis in Young Children

*Practical Points Concerning Its Diagnosis, Treatment, and Prognosis**

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The prognosis of meningococcal meningitis in infants and young children depends to a great extent upon the period at which treatment is begun; hence the great importance of early diagnosis, and unfortunately in sporadic cases diagnosis is usually late.

SYMPTOMS

It is now held that there is always a blood infection at the onset of this disease. The duration of the blood infection before the development of meningitis with its localizing signs may be extremely short—the two may appear coincident as in the fulminant type—or it may be of some days' duration, and not in every patient with meningococcal blood infection does meningitis develop. An interesting series of these cases came under my observation seven or eight years ago. In one child in a family, there developed typical meningococcal meningitis, the two others had pyrexial attacks. Of the latter, one rapidly recovered; in the other there developed arthritis of the knee and from the fluid in the joint the meningococcus was isolated. It seems probable that all these children had meningococci in the blood stream, though two escaped without meningitis. The most constant symptoms of the stage of bacteriemia appear to be pyrexia and vomiting.

Meningococcal meningitis is usually classified into three types—the fulminant type, the ordinary acute type, and the chronic or posterior basic type. The fulminant type with its profound toxemia and prostration is usually associated with an epidemic and is rare in infancy. The socalled ordinary acute type is a variable disease and it is consequently difficult to describe a typical case. The date of onset of the ill-

*A postgraduate lecture given in connection with the Fellowship of Medicine.

ness with pyrexia and vomiting is usually well marked, and symptoms of meningitis—headache, irritability, rigidity of the neck, and perhaps convulsions and squint—are coincident with or may develop shortly after the onset. Later in the disease, convulsions, muscular rigidity, and often tremors occur. The bowels are constipated. As the disease advances the back is usually arched, respirations are irregular, pulse poor and rapid. Occasionally there is a period of complete flaccidity. In an acute case treated early, there may be remarkably rapid recovery; without treatment, or with less successful treatment, recovery, if it occurs, is slow, or, following coma and emaciation, death may supervene in one or more weeks. This type is common in epidemics but is not the usual endemic type in infants. The frequency of skin lesions (herpes, petechiæ, or purpuric rashes) varies with the epidemic and possibly depends on the strain of meningococci present. The temperature is usually irregular. The respirations rate and pulse rate are often variable, as are the degree of rigidity and the presence of squint.

The chronic socalled posterior basic meningitis is the common form in infants, and in this type early diagnosis is usually difficult. The date of onset of the illness can generally be determined, but the early signs of meningitis are often indefinite, and may at first be absent, possibly because meningitis has not yet supervened on the blood infection. Among the many signs which may be present, stiffness of the muscles at the back of the neck and vomiting are perhaps the most useful and frequently present; there is usually constipation but this not infrequently changes to diarrhea as a result of an excessive dose of aperient or unsuitable food, and bulging of the fontanelles is an important sign but is occasionally absent throughout the illness. Neither absence of rigidity of the neck nor absence of a tense fontanelle excludes meningitis. The degree of pyrexia is often slight. A fit may occur at the onset but squint is generally a late sign. The difficulty of early diagnosis is illustrated by such a case as the following:

Case I.—James D., aged four months, was sent to hospital on the fourth day of illness with a diagnosis of scarlet fever. There was pyrexia, some vomiting, and there had been a transient rash. The fontanelle was never tense throughout the illness, and there was no stiffness of the neck until the eleventh day, when lumbar puncture was performed and the diagnosis of meningococcal meningitis established. The patient had ten lumbar punctures and seven doses of antimeningococcal serum given intrathecally, as well as vaccine treatment. By the thirty-eighth day he had grown considerably worse and had undulating respiration (almost Cheyne-Stokes) but thereafter improved rapidly. All rigidity had disappeared by the forty-ninth day. He was last seen at seven years of age and was then perfectly normal.

Though earlier diagnosis is often so difficult nothing is more typical than the disease when fully established, say in the third week or later, the stage so often illustrated in textbooks, when the child is unconscious or semiconscious, and lies on its side with general rigidity, arched back, retracted head, arms flexed, and adducted with thumbs under the flexed fingers. The legs are sometimes flexed, sometimes extended. Emaciation is progressive. The child may die at the end of two or three weeks or may go on week after week, with the head growing larger and the mental and physical condition worse, probably with periods of digestive upset and diarrhea. Blindness is common, nasal feeding may become necessary, and the child occasionally drags on for as long as six months. Gradual recovery, generally with aftereffects, does occur, however, in isolated cases.

DIFFERENTIAL DIAGNOSIS

Meningism.—Meningism is very common in infants, meningitis much less so, and for that reason early signs are often ignored, but in cerebrospinal meningitis the loss of every day in the diagnosis means a lessened chance of recovery. The diagnosis of an acute case of meningitis is often easy, but to avoid the likelihood of missing cases of the posterior basic type, one has constantly to bear the disease in mind and set out to exclude it.

When meningism is present but the signs are indefinite, as so often happens, careful search is necessary for any other cause of the meningism—a commencing lobar pneumonia, particularly apical pneumonia, otitis media, pyelitis, typhoid, even teething. But in the presence of meningism—vomiting, constipation, slight stiffness of the neck, irritability, with or without a bulging fontanelle or the occurrence of a fit—it is in the vast majority of cases wisest to perform lumbar puncture at once, as with proper precautions the risk attaching to lumbar puncture is almost negligible, and the importance of early diagnosis is very great. Such a rule of course would not hold if there were present, for example, early signs of apical pneumonia which is so often accompanied by meningism, but it appears quite unjustifiable to rest content with a diagnosis of, say, meningism from teething unless meningitis has been definitely excluded. Symptoms of meningeal irritation are often present in encephalitis or even poliomyelitis and in such cases lumbar puncture and examination of the cerebrospinal fluid will usually decide the diagnosis.

Once the presence of meningitis is diagnosed a provisional diagnosis of the nature of the infecting organism can sometimes be made from the history and clinical signs, though the diagnosis is not established of course until the causal organism has been found and identified. Pneumococcal meningitis, for example, is an acute and rapidly fatal form with sudden onset, often secondary to pneumonia and coming on in its later stages; streptococcal meningitis, also very acute, is nearly always secondary to bone disease, particularly middle ear disease. Tuberculous meningitis is more common after infancy than under eighteen months of age, the onset is less sudden, there is often a prodromal period leading up to a period of headache, vomiting, and fever, with perhaps a convulsion, and an x ray photograph of the child may practically clinch the diagnosis by revealing evidence of tuberculosis of the lungs.

Turning next to the character of the cerebrospinal fluid. In meningococcal meningitis it is almost invariably turbid, with a spontaneous clot on standing. There is generally reduction in the sugar con-

tent and the cells are usually nearly all polymorphonuclears. There is an easy clinical method of examining for diminution in sugar content in the cerebrospinal fluid which is insufficiently used. One cubic centimetre of normal cerebrospinal fluid almost completely reduces 0.1 c. c. of Fehling's solution, whereas if there is present a smaller amount of sugar than normal (as is usual in meningitis) the blue color of the Fehling solution still remains after boiling together one volume of solution and ten volumes of cerebrospinal fluid. The gram negative kidney shaped diplococci, intracellular and extracellular, can nearly always be found in direct films with careful search. They show up much more clearly in a methylene blue preparation than in the gram. When the organisms are very scanty, however, they may only be obtained in culture, or after incubating a test tube of the fluid for some hours. It is of great importance to remember that unless the fluid is kept warm the organisms will rapidly die and the opportunity of clinching the diagnosis and of determining the strain of meningococci present be lost. Sufficient warmth can be maintained by carrying the test tube containing the fluid in an inside breast pocket to the laboratory. An agar slant smeared with a platinum loopful of blood obtained from one's finger with aseptic precautions forms a very good culture medium.

If one withdraws a turbid fluid one is usually safe in assuming one is dealing with a case of meningitis, but there are certain pitfalls which are seldom noted but are the cause of many mistaken diagnoses. 1. If the needle has been kept in alcohol and perhaps merely dipped into sterile water before use, there may be sufficient alcohol in it to coagulate the albumen and so bring about turbidity of the cerebrospinal fluid and possibly blocking of the needle. 2. Again, once serum has been given intrathecally, the true character of the cerebrospinal fluid in the disease is masked, since serums—some in greater and some in less degree—set up a polymorphonuclear cell reaction, bringing about turbidity of the fluid, increased albumen content, and spontaneous clot. 3. A similar reaction may recur at the time of development of serum sickness, and be accompanied by signs of meningeal irritation suggesting a relapse. The presence of a serum rash may indicate the diagnosis in such cases, and it is generally stated that the sugar content of the fluid is unaffected by a serum reaction when it is reduced in meningitis. 4. The character of the fluid is often masked by the presence in it of blood due to injury of a vein at the time of a puncture. Fluid obtained from a puncture on the next day or two after such an injury is sometimes strawcolored from altered blood, and may give a fine cobweblike coagulum on standing, and so lead one falsely to suppose one is dealing with a case of tuberculous meningitis or possibly encephalitis. 5. Lastly, in certain cases, secondary for example to middle ear disease, there may occur a low "leak" of pus cells into the cerebrospinal fluid without a general inflammation and without organisms in the cerebrospinal fluid, but with these cases we are not concerned.

The leucocyte count of the blood is of little value in differential diagnosis, since most of the acute illnesses which may be associated with meningism, as well as all forms of meningitis, usually have a polymorphonuclear leucocytosis. It is, however, useful when the diagnosis lies between typhoid with its leucopenia and meningitis.

TREATMENT

Specific treatment.—Successful treatment is of course dependent upon a suitable serum being available. As yet no satisfactory method of standardizing these sera has been found, hence the clinician is largely dependent upon the method of clinical trial. However, on account of the different strains of meningococci, a serum which has given excellent results with one group of cases may not necessarily give good results with another. When facilities offer, it is desirable to have the type of the infecting organism determined, but as this may take two or three days (while a culture of sufficient growth to form a good emulsion for the agglutination test is obtained) it is essential to use a polyvalent serum in the first instance, though later a "type" serum may be substituted if obtainable.

An anesthetic should, in my opinion, be disposed with whenever possible for the operation of lumbar puncture; it is seldom necessary in the case of small children and never for infants as they can be held steady. An anesthetic may mask the signs that sufficient fluid has been drawn off, and so be a danger, and, more important, it always causes unnecessary disturbance to the feeding and general condition—a point of primary importance in a wasting illness in which lumbar puncture may be required daily for many days.

If, from the clinical picture at the time lumbar puncture is first performed, meningococcal meningitis appears a likely diagnosis, a phial of polyvalent antimeningococcal serum should be warmed to about blood heat in water while the lumbar puncture is being carried out, and, if the fluid obtained is turbid, serum should be injected without waiting for its bacteriological examination. This is recommended because if the case should turn out to be, say, pneumococcal or primary streptococcal meningitis, it will in any case almost certainly prove fatal; if it is meningococcal meningitis the prognosis depends largely on how early in the disease serum is administered.

The amount of fluid drawn off will depend on the degree of pressure and the condition of the child—its color, pulse, respirations, and the condition of the fontanelles. The amount of serum given to an infant at one dose will probably not exceed fifteen c. c., and it is generally agreed should never exceed in volume the amount of fluid withdrawn. If it is given extremely slowly there seems no objection to giving it with a record syringe instead of by the gravity method. After the intrathecal injection the foot of the bed should be tipped or the child's buttocks propped up. This is probably the most useful means of combating the shock which may be present, and it presumably assists the serum to reach the ventricles.

Occasionally the serum produces a toxic reaction, and such serums have to be discarded. If there is no contraindication, it is my practice to repeat lumbar puncture at first daily, and later every second day, for as long as the fluid is under excessive pressure,

remembering that excessive pressure alone will quickly cause irreparable damage to the brain. The administration of serum is repeated daily until no organisms can be found in the direct film of the fluid or grown in cultures. The most frequent contraindication is a distinct worsening in the child's condition after the operation, in which case it will usually be necessary to seek another less toxic serum. The possibility of anaphylaxis has to be borne in mind if it is desired to give an injection of serum after a week's interval for a relapse, and in such cases it would be wise, with a view to desensitizing the patient, to give in the first instances about one c. c. hypodermically, and to wait six hours as is usually done in cases of diphtheria.

When intrathecal pressure is not excessive one may easily fail to obtain fluid by lumbar puncture in an infant, even when there is no block to the circulation of the fluid. Much depends upon having a fine needle with a really sharp point. If no fluid or only a few drops can be obtained after several attempts, one may with infants fall back on ventricle puncture. This is an extremely easy operation if the pressure is great and the fontanelle is bulging, with only a thin layer of brain substance above the lateral ventricle, but there is always a certain risk of damage to the brain thereby. To avoid unnecessary injury the head must be kept steady, and this should be the whole duty of one assistant. A small bore needle with a light head should be used, and gently supported all the time it is in position to prevent all avoidable movement in the soft brain substance. The puncture is usually made in the outer angle of the anterior fontanelle about three quarters to one inch from the midline, and the direction of the puncture aiming a little in front of the ear.

GENERAL MANAGEMENT

The feeding in cases of posterior basic meningitis is often difficult, and there is grave risk in infants of setting up an intractable diarrhea with unsuitable food or aperient. If swallowing becomes impossible, nasal feeding may be necessary. A case is described below in which the patient recovered after forty-five days' nasal feeding, during half of which time he could not swallow at all. Consequently the illness should never be considered hopeless because of inability to swallow.

The patients are difficult to nurse, and require great attention to avoid bedsores, intertrigo of the rigidly flexed hand, or stomatitis, and to prevent the occurrence of contractures during convalescence.

PROGNOSIS

Prognosis in the average case of posterior basic meningitis appears impossible, but everyone dealing with such cases requires to remember the extraordinary recoveries sometimes made in apparently hopeless cases. The percentage of recoveries in a group of cases will depend very largely upon the availability of a serum suitable for the particular strain of meningococci prevalent; but the number of fatal cases and of cases with serious sequelæ (hydrocephalus, mental defects, spasticity, paresis, and loss of hearing or vision) is always very high.

An acute case of meningitis treated early may make a very rapid recovery—witness a boy brought into hospital unconscious, and given serum, who within forty-eight hours was heard to greet his mother in a new hat with "Hullo, some hat." In the more chronic posterior basic case, however, when recovery does take place, the progress is usually extremely slow, the rigidity may persist for months, and not infrequently the child gradually relearns to sit up, walk, and speak like an infant learning for the first time, though recovery even in such cases may be complete.

Case II.—Ernest W., aged four years, was admitted on the twenty-third day of his illness, unconscious, back arched, head retracted, limbs flaccid. Twenty-five lumbar punctures were performed in all, the last on the seventy-third day of his illness, thirty to sixty c. c. being withdrawn each time. Nine doses of serum were given, and also an autogenous vaccine. Prognosis was bad for about two and one half months after admission; the occiput was touching the back, there was extreme emaciation with rigidity, strabismus, incessant twitching of the right side of the face, arm, and leg for days on end, and for forty-five days nasal feeding had to be resorted to. On the eighty-eighth day of illness the child swallowed again for the first time, and from that date put on weight and became later enormously stout with a remarkably thick coat of hair over the limbs and trunk. Five and a half months after the onset he still lay, taking no notice of anything, like a log in bed, with intervals during which he screamed for hours at a time. He was sent out of hospital, and the mother gave an account of how the child began gradually to take notice of and then learned to know her, to recognize objects, and to speak "like a baby learning for the first time." It was nearly a year from the onset of the illness before he relearned to walk. Two years after the onset he was still using the right hand very little, though there was no paralysis and no aftereffects remained in the right side of the face or right leg. At this age he was intelligent enough to do simple shopping errands for his mother. Now, at ten years of age, he is going to a school for backward children and is "no use at bookwork" but is intelligent enough to be very useful to his mother in the house. He has recently suffered from fits.

Even in cases which have required ventricle puncture the patients may make remarkable recoveries.

Case III.—Mary S., aged five months, was admitted on the tenth day of her illness, with early signs. Lumbar puncture was attempted seven times in all, only twice was any fluid obtained, though the fontanelle was bulging greatly after the first few days in hospital. Twenty-one ventricle punctures were performed, fifty to one hundred c. c. being withdrawn on each occasion, the last on the fifty-third day of the illness. Four doses of serum were given. After the last lumbar puncture there was for four or five days a leak from the ventricle through the puncture wound—in sufficient quantity to soak a large pad of wool in a few hours—and to my surprise, from that time the child began to improve and the head circumference diminished. There was head retraction for about four and one half months from the onset. When two years and nine months old, when last seen, the child, though talking moderately well, was backward for her age. This

was due, in part at least, to the physical retardation brought about by rickets of some severity; the mental improvement had been marked after treatment for rickets was begun. There was strabismus, but no other physical defect traceable to the attack of meningitis.

Strabismus is a common sequela of meningitis, and nerve deafness not uncommon. Some patients may have normal intelligence and learn to lip read; some are deaf mutes.

Prognosis is complicated not only by the extraordinary recoveries in some of these cases, but by the fact that aftereffects occasionally develop long after the attack; for example, in Case II the patient began to suffer from fits over five years after the onset of meningitis.

Then again sudden death occasionally occurs a considerable time after the illness, even though there has been apparently complete recovery. The following is presumably a case of this class:

CASE IV.—Arthur M., aged eight months. Admitted twenty-first day of illness, deeply unconscious with rigidity, squint, unequal pupils, and head retraction. Lumbar puncture with the injection of serum was performed daily for seven days, thereafter puncture was dry or nearly dry. There was difficulty in swallowing and progressive wasting after admission, and food by mouth was supplemented by nasal feeding for over six weeks. On the fiftieth day the occiput was still touching the back. Nearly three and one half months after the onset the child was still taking little notice, was unable to sit up, and had slight head retraction. About five months after the onset, at one year old, he was taking an interest in his surroundings and all rigidity had gone. He did not walk steadily until two and one half years old. When seen at three years and two months and again at seven years old he appeared a perfectly normal and especially alert and intelligent child. Shortly after this date he died very suddenly one night in his own home. No history could be obtained suggestive of a fit.

CONCLUSIONS

From the cases quoted it is obvious that when treating a case of posterior basic meningitis one should never allow the child's attendants to give up hope—though on the other hand even in the cases seen early with few signs one cannot give a good prognosis. Prognosis will depend on such factors as, 1, the availability of a suitable serum; 2, stage of the disease at which it is diagnosed; 3, measures taken to prevent so far as possible irreparable damage to the brain from excessive intracranial pressure; and 4, last but by no means least, the skill of the nursing and the tenacity of the medical attendant and nurse.

A Case of Vascular Nevus in an Infant Treated With Radium*

A. W. JACOBS, M.D.
New York

It is generally known that radium is a valuable agent in the treatment of vascular nevi. The case reported is of interest firstly, because it shows the necessity of persistence in treatment, and secondly, that radium though applied to such close proximity to the eye has shown no deleterious effects upon the tissues of the eye.

CASE.—G. S., aged eleven weeks. Was brought to the Montefiore Hospital Radium Clinic on October 10, 1923, with the following history: Premature birth (eight months). Breech presentation. Birth weight four pounds six ounces. Breast fed every three hours. About one and a half weeks after birth mother noticed a small red spot about the size of a small pea over the inner canthus of left eye. Has been increasing in size and continued to become a brighter red in color.

FIG. 1.—Case of vascular nevus before treatment.

FIG. 2.—Same case as in Fig. 1, after treatment.

Physical examination showed a well nourished, vigorous, female infant weighing seven pounds seven ounces. Local condition showed an elevated, pinkish, red mass about one and a half by one half cm. in size, located just above the inner canthus of left eye. The lesion was treated weekly with radium applied to the lesion in an applicator, screened with one half mm. brass and one half cm. gauze filtration, average being fifteen cm. of radium emanation applied for three hours. The first treatment was given on October 14, 1923, and the last treatment on February 17, 1924, making a total of fifteen treatments. Ophthalmological examination after the series of treatments shows the eye to be in normal condition. At present there is a pale white area over the site of the original lesion as shown in the photograph of the infant at the age of eight months.

125 WEST SEVENTY-SECOND STREET.

*From the service of Dr. I. Levin, Cancer Division, Montefiore Hospital.

Historical Medicine

Concerning the Physiological and Therapeutic Rôle Played by Animal Testicular Extract as Shown in a Number of Cases in Man*

M. BROWN SÉQUARD

Translated from *Archives de Physiologie*, Series 1, 1889, page 739, by L. L. Stanley, M. D., San Quentin, California

Since the experiments which I have made upon myself have been published, the public press of both continents have printed a great deal without knowing anything about them (*on a parlé sans les connaitre*), and unfortunately has awakened in thousands of people weakened by age, sexual abuses and other infirmities, absurd hopes which are to be promptly discarded. In the United States especially, often without knowing anything about what I have done, nor the most elementary rules in regard to subcutaneous injections of animal material, many doctors, or rather unauthorized practitioners, quacks and charlatans, have exploited the ardent desires of a great number of people and have subjected them at least to the greatest risks if they have not done worse.

I should like to be able to tell what the results have been from thousands of injections of testicular extract which have been made in America and other places.

Unfortunately the principal elements of a serious appreciation of the subject are almost completely lacking, chiefly because I do not know anything about the work of most of the physicians of the United States except from the articles of reporters in the public press.

I shall point out presently the works published by a certain number of physicians; but it is important to be able to compare them with those other observers whom I would like to make understand the results of the experiments which I made upon myself and which were reported in another communication.

The thought which led me to do these experiments was that the weakness of old age depended in part on a diminution of the activity of the spermatic glands. I have believed and still believe that the facts which I have reported give proof that the vigor of the nerve centres and other parts of the organism is linked with the secretory powers (*la puissance secrétoire*) of the testicles. Admitting this to be true, it is entirely natural to think that in giving to the blood of an old man, by subcutaneous injections, a liquid extracted from young and vigorous animals, one might succeed in making up for the insufficiency of his spermatic secretion. It was also reasonable to believe that in addition to this special influence, the injected fluid would also increase the secretion of the testicles.

It seemed, according to the reports made by authentic physicians, that this special effect had been obtained with old men, as well as with men still young, who had been weakened by excessive venery.

Some have thought that all the action of certain elements of the injected liquid consisted in a stimulation of the nerve centres or other parts. In fact, it would be necessary to forget completely the most simple ideas about the action of physical agents, of medicaments and of poisons upon the animal organism, to accept such an opinion. In truth we know that two kinds of effects can be produced by these agents or substances; one consisting of a stimulation followed by putting into play (*mise en jeu*) the part irritated; the other consisting in an increase or diminution of the power of action. In all the changes which I have shown to have taken place in me, there has not been a putting into play of any power, and moreover, these changes have lasted whole weeks, and there is one which is lasting even up to today, more than three and one half months after the last injection; that is, the improvement in defecation which is sufficient to show absolutely that stimulation is not the cause of the changes. It is clear that that which has taken place is an increase in the power of action. What remains to be decided is to know whether it is true generation of physical power (*dynamogénie*), that is to say, a purely dynamic change which has taken place. Some of the effects are so prompt in appearing that it seems probable that for them at least it is that which does take place (*c'est là ce qui se produit*). But other effects are rather slow and it appears certain that it is the result of an improved nutritive action, that is, an organic change where the force is increased in certain parts. The liquid extracted from the male sexual glands probably therefore will act on some organs in producing a pure generation of force (*dynamogénie*) and in others by activating nutrition.

Great ignorance is shown by those who hold that it is impossible for old men to return to a better organic condition or a condition of health such as they had at a younger age, because organic changes, due to an improvement in nutrition, are possible at all ages. I do not wish to discuss today the question of knowing what are the substances contained in the injected liquid to which the effects are due. Numerous experiments ought to be made to obtain the solution of that problem. All I can say is that the spermatozoids (*les animalcules spermatiques*), which have a special physiological rôle, had no dynamogenic influence on the liquid used in my experiments for these solid particles do not pass through the Pasteur filter. Of this M. Henocque is positively sure.

I ought to say that I know, having studied it with care, an extremely remarkable and conclusive case which demonstrates that the spermatozoids are not a part of the liquid secreted by the testicles which gives to man the various physical, mental and intellectual activities that are lacking in the eunuch. In fact, in an officer, outstanding for his vigor and other mental and physical qualities and also for his sexual pro-

pensities and the quantity of sperm which he produced, there was entirely lacking the spermatozoids in his secretion. Professor Cornil has been convinced of this for a long time and M. Henocque and myself more recently. Besides it is probable, a priori, that the spermatozoids did not participate in the dynamogenic action of my injections. Although we know that they cannot be absorbed and that it is the liquid part of the sperm which, being absorbed, is the vivifying agent of old and young individuals who have active testicles.

All that I wished to obtain by previous publication was that other aged doctors and physiologists would do upon themselves experiments similar to mine. Only two in Paris have made such tests. Their results have generally been favorable. Of them I will speak presently. Unfortunately the effects produced have not been sufficiently studied.

In the many observations published already, particularly those of Dr. Variot, of Paris, Dr. Villeneuve, of Marseilles, and Dr. Loomis, of New York, the persons treated have been studied only a certain period of time. One is assured that certain good effects have been produced and after one or two weeks they have not been studied further.

There are two phases to the influence exerted by a liquid extract of the testicles; one consists purely and simply of the physiological effects which it produces and the other in the researches for the therapeutic effects. No one has yet to my knowledge made, either separately or together, a study of these two kinds of manifestations. One would have to find out among old men of good health what the effects produced really are; that unfortunately has not been done. My greatest aim now is to cure disease. Checks or obstacles which one expects have been forthcoming, and successes except in some cases have not been sufficiently established.

Doctor Variot has the credit of being the first to study in old men the action of the fluid taken from the testicles with the end in view of assuring himself that that which I have found in myself would manifest itself in other people. I can only mention here briefly that which he has found.

OBSERVATION I

A man, aged fifty-four, afflicted with anemia and chronic diarrhea. He was given two injections of testicular liquid. That evening unusual feelings of well being (*sensations de bien-être*) which lasted during the next day. He had, he stated, a clearer head, more supple limbs and more vitality. His vision was more acute and he could walk without fatigue. His lost sexual power returned.

OBSERVATION II

A man, aged fifty-six, who could hardly stand upright nor walk a few moments without being obliged to sit down. After three injections he acquired considerable vitality, became jolly, full of spirits, and appetite greatly increased.

OBSERVATION III

A man, sixty-eight years of age, who could scarcely leave his bed. The day following the two injections he walked with pleasure and felt much stronger. Appetite was greatly increased. Morning erections were intense. He had had none before in two months. Bowel movements became possible without enema.

Since M. Variot published his three cases (*Comptes rendus de la Société de biologie,* 5, Juillet, 1889) he employed injections of testicular extract of the rabbit and guineapig in a number of other diseases. It is not possible to give an analysis of all these cases some of which have been negative. I will mention only four or five.

Among Variot's cases, the most important was that of a physician aged sixty, who after a course at Vichy was excessively feeble and felt entirely tired out. According to his own statement he had gained considerable in mental activity and in strength of muscles as well as sexual powers after only four injections, two each day. That was last August. He wrote me, under date of October 6th, saying that the good effects had continued, although he had not had any further injections.

Another case was that of a doctor in Paris, aged thirty-five years, who was afflicted with sexual impotence and of very great weakness. After six injections there was an increase of strength and the ability to have sexual relations.

In an old man, eighty-one and a half years old, without marked infirmity, there was no noticeable effect of the injections until after some weeks, when he wrote to Dr. Variot that the injections had been a complete success with him, particularly the last two. He felt, he said, a great increase in power in all respects, as if he was only about twenty to twenty-five years of age.

In one control experiment Dr. Variot made two injections with a fluid stained with blood, and he stated that the patient, aged fifty-eight, afflicted with diarrhea and bronchitis, did not experience any good effects. Without letting it be known to the patient what was being given, a liquid taken from an animal testicle was injected and from the day following he affirmed that he was very much better, that his brain was clearer and that he experienced a feeling of unusual well being. Erections had returned two weeks after the last injection. He said that he was put back on his feet by that injection and the good effects still persisted at the end of six weeks.

An interesting work has been published by one of the most distinguished physicians of New York, Dr. H. P. Loomis (*Medical Record,* August 24, 1889), reporting the results of the injections extracted from testicles of the ram. Unfortunately, these injections, as those made by other doctors who have repeated my experiments, have been made almost exclusively on sick people. The favorable cases have been those of men aged fifty-six, sixty-two, and seventy-seven years, the most remarkable of all. Seven other patients have not had any good effects nor have had their disease made worse. That took place in one case of rheumatism and one case of locomotor ataxia. (1)

I will only say a word about the report of a well known physician, W. A. Hammond (*New York Medical Journal,* August 31, 1889, pp. 272). This work contains nine observations, one where the in-

[1] I know of five cases of locomotor ataxia besides those reported by Dr. Loomis, where the injections of testicular extract have been used. The disease was not increased in any of them but in two there was no change in the condition. In two there was slight improvement and in the fifth a very considerable amelioration.

jection was made on a woman, all showing extremely favorable results, not only in cases of infirmities but various diseases and even in certain affections of the heart.

Another American, Dr. Brainard, of Cleveland, up to the fifteenth of last August used the injections on twenty-five people, five of whom were women. Most of them were ill and extremely favorable effects have been obtained in almost all of them. The extract was taken from rams, as in the cases of Dr. Loomis and Dr. Hammond.

I have received from Dr. Grigorescu, of Bucharest, two reports partially favorable. These proofs which I have and a number of others do not permit me to suppose that that which I have observed upon myself has depended in part or entirely upon a special idiosyncrasy or an auto suggestion.

In spite of a lack of details in all observations so far published and in spite of the number of criticisms which undoubtedly deserve to be given to a great number of them, there is nevertheless evidence that the testicular extract as employed has produced upon the nerve centres all the dynamogenic effects which I have observed upon myself and others as well.

There is nothing to show that they do not exist, but I repeat that the effects as shown by me have been observed a great number of times. Other dynamogenic phenomena have also been found with those who were ill and especially in cases of weakness of the heart action.

It is therefore without doubt that subcutaneous injections of diluted fluid extracted from testicles of animals living or those just killed exert a considerable dynamogenic effect on the nerve centres, at least in a large number of persons. It cannot be doubted likewise that these injections are harmless if they are made with all the precautions which capable physicians know to be essential when they introduce under the skin any animal product (*matières animales*).

The London School of Medicine for Women

A Retrospect

For fifty years the London School of Medicine for Women has been giving medical education to women and sending its graduated students out to do work of a very varied kind in private practice, in clinics and schools for mothers, as specialists and, perhaps most important, as workers among the women of India whose religious or caste rules do not allow of their being treated by men. Medical women have devoted themselves with few exceptions to the service of their own sex and have succeeded in gaining the confidence of thousands.

They have created the demand, they have provided the supply and during those fifty years they have borne themselves with dignity and done their chosen work with ability; so that now, at the close of their half century, they are celebrating the jubilee of their own school and asking that those who know the value of what they have done should help them to found three chairs in that school to the memory of three great pioneer women in medicine: Elizabeth Blackwell, Elizabeth Garrett Anderson and Sophia Jex-Blake.

Mary Scharlieb, the doyenne of medical women, is now president of the school. She has had a wide experience covering almost every kind of work done by the medical women of the present and the past—from attending the purdah women in the East to private practice in the aristocratic precincts of Harley Street. She is justly proud of the position which the school holds today. Looking back over the fifty years of medicine in the course of an interview she recalled her own beginning of work in Madras. When she was a married woman with children and was helping her husband, who was a barrister, it fell to her lot to review a monograph on Medical Jurisprudence for the *Madras Jurist* and thus her interest was first aroused in medicine. At the same time she was constantly hearing of the sufferings of Hindu and Mahommedan women in sickness and in childbirth when, owing to purdah rules, they could not have a male physician to attend them. There was one terrible incident of a young Mahommedan lady, no more than a child in years, whose husband, unable to bear the sight of her sufferings, sent for a European surgeon to relieve her. The poor child dragged herself to the door of her room so as physically to prevent his entrance and died in that position.

This incident had a profound effect on Mrs. Scharlieb. "I felt," she said, "that there ought to be European women doctors qualified to deal with such cases and I began to study midwifery privately in 1870. Desiring to get practical training I was introduced to Surgeon-General Balfour, the head of the Medical Service in Madras, and through him to Surgeon-Major Cockerill, the superintendent of the Lying-In Hospital. He was a weary looking man with Dundreary whiskers but an excellent officer and a good obstetrician. He was sceptical of my strength of will and perseverance. 'You won't like it,' he said, 'it is very dirty work.' I told him my clothes would wash. 'Your husband won't like it' was his next objection. 'If my husband did not like it, I could not be here,' was my answer.

"He then objected that my health would not stand it and, finding nothing shook my determination, he asked would I nurse any case that might be given to me. When I said I would, he brought me out in the blazing sunshine to a leaf pavilion in the hospital compound and there I saw lying on a cot what looked like a small hippopotamus. It was a woman so swollen that she was hardly recognizable. 'Will you nurse her?' he said. 'It is the worst case of confluent smallpox I have ever seen.' 'Yes,' I said, 'I am quite prepared.'

"When the Surgeon General asked me later how

The London (Royal Free Hospital) School of Medicine for Women (University of London). Founded in 1874.

I had dared to accept Surgeon Major Cockerill's challenge I told him for two reasons—I had been revaccinated the week before, and I did not believe he would hand such a case to a beginner; and I was right, for the woman died that night."

And so began Dr. Scharlieb's training in duty at the hospital from 6 a. m. to 6 p. m. After a year she found that a knowledge of midwifery and the diseases of women was not sufficient to make her a really useful adviser to Hindu and Mahommedan women and that a knowledge of general medicine and surgery was also necessary. This was the time that the agitation which led to the formation of a school of medicine for women was going on in England, but family circumstances prevented Mrs. Scharlieb from immediately returning to take part in the movement. Instead, she secured the interest of the Governor of Madras, Lord Hobart, and of Surgeon General Balfour, in a scheme for the provision of medical women for caste and Gosha women. Four women, of whom Mrs. Scharlieb was one, enrolled themselves as students of the Madras Medical College for the winter session of 1875. And that event was as sensational in its own way and perhaps meant as much to the women of India as did the opening of the London School of Medicine for Women in 1874. The Government of Madras saw the necessity for medical women and made arrangements for them on a generous scale; they paid no fees, textbooks were given to them and a room at the Medical College was assigned to them. They shared in the instruction given to the young men who were preparing to be assistant surgeons and sub-assistant surgeons in military and civil employment under the government of Madras. Their practical midwifery was taken at the Lying-In Hospital and other clinical work at the Women's Hospital. At the end of three years the four students received the Licentiate of Medicine, Surgery, and Midwifery from the Madras Medical College and then Mrs. Scharlieb, who had secured admission to the General Hospital in Madras because the teaching arrangements there were sufficient to satisfy the requirements of the University of London, returned home to take the M. B., B. S., degrees. From that time her history merges into that of the London School, and she passed through the strenuous curriculum. When she received the gold medal and scholarship for Obstetric Medicine in the final M. B., B. S., the examiners were the late Dr. Mathews Duncan and the late Dr. Gervis. The latter is said to have remarked: "Oh, to think I have lived to give the scholarship in my own subject to a woman. But there, it was an excellent paper and it can't be helped!"

Mrs. Scharlieb went to Vienna for operative midwifery on the living preparatory to her work in India and on her return received a summons to go to Windsor to see Queen Victoria. The Queen asked for the truth about her women subjects in India and got it. Mrs. Scharlieb told her at length of the sufferings of caste and Gosha women owing to the impossibility of their being attended by men doctors and of the frequent failure of the methods of the native midwives. When she had heard this, Queen Victoria turned to her lady in waiting and said "How can they tell me there is no need for medical women in India?" And then this great Queen, who

was herself against any emancipation that she thought would lower the social prestige of her sex, gave Dr. Scharlieb this message for her Indian patients—"Tell them how deeply their Queen sympathizes with them and how glad she is they should have medical women to help them in their times of need." She added, "I will give you my photograph and you must take it with you to their houses to show them how much I feel for them." And that photo in its heavy gilt frame was a talisman for years in India.

Until February, 1887, Mrs. Scharlieb remained in practice in India, where she was lecturer on Midwifery and Gynecology and the Diseases of Children at her old college. She was also Medical Superintendent of the Royal Victoria Caste and Gosha Hospital until her health broke down and she returned to England. There her later history is well known. She was appointed one of the surgeons of the New Hospital for Women (now the Elizabeth Garrett Anderson Hospital) and subsequently to the Royal Free Hospital. This was the only one of the twelve great London hospitals to which no male medical school was attached; in 1877 it admitted women to clinical practice in its wards, thus beginning its connection with the London School which has lasted ever since.

Dr. Scharlieb's views on women physicians and surgeons are distinguished by strong common sense. She makes no undue claims for them. She thinks that in work among women and children is their greatest sphere. "There is a strong demand for women doctors," she said, "a woman in childbirth who has been attended by a woman will seldom have a man again, and many men doctors in cases of women's diseases send their patients to a woman doctor. I have always been good friends with my male colleagues—I have a son a doctor—I see their goodness, their kindness and their skill; but I am not prepared to admit that women do not possess the same qualities, and the curious thing is that there are more women skilled as surgeons than as physicians—which is not what the public would expect. I have perfect confidence in the future of medical women. They are being more and more utilized in the public services, they are in growing demand as general practitioners, for the running of philanthropic enterprises and as medical missionaries. If the young women coming into the profession play the game honestly and devote themselves to their work, comporting themselves with dignity in their student days and preparing themselves for a life which will try them and make many demands upon their personality as well as on their skill, they will have nothing to fear.

"I think it is a good thing for women to keep to their own school," she went on. "At the present time I do not approve of mixed schools—not for the foolish reasons often assigned but because the authorities will always naturally prefer the young men to the young women when it comes to those appointments on the senior staff which give experience, opportunity and prestige. From this point of view it is a waste of time for a woman to be working at a mixed school where she can never rise to the top. At the Royal Free Hospital there is a mixed teaching staff and women share the senior posts with the men. At the Women's Hospitals the entire staff are women; for this reason it seems better for the young students to go where they will have fuller opportunities."

William Bullein.—"William Bullein was an English physician, botanist, and ecclesiastic of the middle of the sixteenth century, to whose ill fortune we are indebted for a most interesting book," writes Dr. Alfred J. Brown in *Surgery, Gynecology and Obstetrics,* February, 1925. "He was born on the island of Ely during the early part of the reign of Henry VIII, and died in London in 1576. His early education was gained either at Oxford or Cambridge, or possibly both. Later he studied for the ministry and for four years held a rectorate in Suffolk. He practised for a time in Durham and then moved to London, where he attained considerable reputation.

"In 1548 he published a book which was called *The Government of Health,* which was reprinted ten years later. In this reprint he promised to publish another book in a year, referring to his *Bulwarke.* This he wrote, but the copy was lost in a shipwreck. In the meantime William Hilton, a brother of Sir Thomas, the Baron of Hilton, to whom *The Government of Health* was dedicated, brought against Bullein the charge that he had murdered one of his patients. This kept Bullein under surveillance for a time, and then, the accusation failing, Hilton had him imprisoned for debt. He was later found not guilty of this charge and freed.

"The lay literature of the time frequently used dialogue as a means of expression and Bullein borrowed this method in his surgical treatise; the sick man and the surgeon carry on a conversation regarding various surgical conditions. In the first part of the dialogue the surgeon tells the sick man what surgery is and what the surgeon should be. It contains a diatribe against untrained and irregular practitioners. Some of these he characterizes 'like as the swarmes of vagabound Egyptians.' He says they travel from town to town 'with a box of salve, and cases of Tooles' and when they can get nothing else: 'Then fall they to Palmistry, and telling of fortunes, dayly deceiving the symple.' He defines surgery as an art rather than a science and divides it into two parts, the first 'Theorica' and the second, dependent on the first, 'Practica.'

"Bullein's characterization of the requirements of a surgeon are given as follows: 'Eight things or propertyes of a good Chirurgian. He must begin first in youth with good learning, and exercise in thys noble arte, he also myst be clenly, nimble handed, sharpe sighted, pregnant witted, bolde sprited, clenly apparayled, pytefull harted, but not womanly affectionated to weepe or trimble, when he seeeth broken bones, or blouddy woundes, neyther must hee gieve place to the cry of hys soare pacient, for soft Chirurgians maketh fowle soares. Of the other syde, he may not play the partes of a Butcher to cut, rend, or teare the body of man kinde. For although it be frayle, soare, and weake, yet it is the pleasure of God, to call it hys Temple, hys Instrument, and dewelling place, and the Philosopher doth call it Orbiculus, that is a little world.'"

Editorial Articles

PRESERVATION OF THE UNFIT

Those who have studied the history of the human race in its evolution have noted the way in which periods of great privation are followed by migrations which in themselves constitute further hardships. The migrants, once they have reached a suitable environment, tend to progress physically, economically and culturally but after a time retrogression begins to take place; the descendants of the sturdy pioneers who braved hunger and all the forces of nature become weaklings and hence are the prey of some ruder, stronger civilization. The original migration killed off all except the strongest of mind, body and character; the racial stock was improved and was able to maintain its supremacy until a period of security and prosperity permitted the substandard members of the tribe to reproduce and increase in numbers. When the point was reached where this group was larger than the number of the virile and intelligent, the race was doomed to extinction, subjugation or migration. It was the old story of the ascendancy of the fit over the unfit, the oft repeated tale of the manner in which the forces of evolution operate by selecting the best of a stock for preservation and discarding the weaker brains and bodies.

This process is going on in America today. In spite of the difficulties imposed by our immigration laws a constant stream of other races is entering the favorable environment of the United States and it is safe to say that the number of clandestine entries exceeds those admitted legally and probably is better stock than those who come in the ordinary way. A considerable degree of fortitude, persistence, foresight and physical resistance is necessary to elude the vigilance of the immigration officials, cross the borders of the nation and effect a settlement in a land of alien speech, customs and conditions. It is no wonder that the descendants of these people make rapid economic, cultural and social progress. Any voluntary migration, no matter how many improvements have been made in transportation, requires a certain amount of determination and physical strength and those who migrate are generally hardier and of better mental fibre than those who stay at home.

The sufferings and poverty of the settler and the first generation are generally severe and the process of adjustment to new conditions of industry and life weeds out many of the ineffectives. Thus the ruthless forces of Nature, by sheer brutality, improve the character of the stock.

In the United States there is going on also an intranational migration. There is a constant flow from the older settlements of the Atlantic seaboard into the less thickly populated portions of the United States and stocks which have undergone deterioration in the effete East blossom again in the more rigorous atmosphere of the younger states.

In the meantime, what is to become of the weaklings and defectives which are being bred in the security of an older civilization? It is not entirely because of improved methods of diagnosis that the number of persons confined to institutions for the care of the insane has increased so rapidly. Had the same proportion of mental alienation persisted in the original settlers of North America, the United States would never have been. In the hard days of conquering the new land, the weaker elements among the colonists perished; today they are safeguarded, protected and permitted to reproduce their kind.

This raises an important question. Is public health and the great humanitarian movement of today attempting by the conservation of fit and unfit alike to turn aside the great evolutionary forces of Nature? The modern tendency is to give to the defective even greater attention and care than is accorded to the normal: every effort is made to preserve the abnormal child, to render it selfsustaining in adult life and to safeguard its children. This may be of temporary benefit to the economics of the present, it may improve community character by indoctrinating kindliness and charity but what of the economics and character of the future when the defectives are in the majority?

Man is groping after the solution of this problem. Genetics, the birth control movement, the prophylaxis of syphilis—that arch creator of defectives—prenatal hygiene, the sterilization of the insane and the various methods being put into force for the maintenance of a physically and mentally rugged stock act to a certain extent to ward off racial deterioration but the conservation of the less fit continues and is being aided by sanitarians. Does the good work which public hygiene is doing overbalance the potential injury to the racial stock which may accrue from the perpetuation of the poorer strains? Scattered over the Western Hemisphere are the monuments of once flourishing civilizations which have absolutely disappeared. Is this going to happen again?

Evolution is inexorable; it permits no race to stand still. Man must go forward or backward or be exterminated. If he is sufficiently intelligent, if he has adequate selfcontrol, he may possibly turn this ruth-

less force to his betterment. Lacking these qualities, the dominant races of today will not escape the ruthless law that man must progress or retrograde, migrate or undergo subjugation and extermination.

CHANGING VIEWS AS TO DIET

Medical opinion with regard to diet has changed considerably during the past few years, and is still changing. It is now almost an article of medical faith that a diet should consist of food containing the usual food constituents of civilized life in due proportion, and especially the mineral salts, modified and regulated with regard to climate, occupation, and so on. Also the personal equation must be always considered. There is no more true saying than that "one man's meat is another man's poison." Views regarding diet are changing chiefly with respect to the sophisticated foods of civilization and it seems to be becoming more and more evident that the somewhat primitive methods of preparing and cooking food are better adapted to the establishment and preservation of sound health. Whole wheat bread, for instance, in which the husk has been left and in which close milling has not refined away many of the most nutritive properties, is a more healthful food than the very white highly milled bread which is generally put before one in restaurants. Such a bread is not only more nutritious, but on account of its rough content, favors peristalsis and is a remedy for constipation, one of the greatest banes of modern life. Again, too long cooking or cooking at a high temperature is a fault of civilization; much of the nutritious effect of food is spoiled or impaired by too great heat or by heat too long continued.

The importance of the vitamine element in diet appears to have been established firmly, although there are those who refer to these elusive substances as hypothetical and state that if the mineral salts are present in their correct quantities, the vitamines will take care of themselves. However, this statement does not mean that the vitamines are not essential, but that if the necessary amounts of mineral salts are supplied, these will contain the essential vitamines. Fresh vegetables and uncooked fruit are other articles which are indicated in a healthy diet, more particularly perhaps for those who lead a somewhat sedentary life. Vitamine A is contained in green vegetables, spinach and cabbage, carrots and cereals. Vitamine B not only includes the antineuritic vitamine found in rice polishings, but a water soluble, growth promoting substance found in a number of foods. It is not readily destroyed by heat or oxidation and is said to stimulate glandular matabolism and to be concerned in carbohydrate metabolism. It is found in cereals, nuts, tomatoes, lemons, oranges, vegetables. Vitamine C, known as the antiscorbutic vitamine, is contained in raspberries, oranges, lemons, tomatoes, carrots, legumes, lettuce, onions, greens, and sprouting grains. A high temperature applied for a short time is less destructive to this vitamine than moderate heat applied for a long time.

From a consideration of the diet question from the viewpoint of the vitamine, two or three points stand out prominently. It is conceded that a certain quantity of the various vitamine elements is essential for continued good health, and it is further known that a high temperature will injure one vitamine and a continued moderate temperature will impair the nutritive properties of another, while heat has less effect on yet another. Yet cooking injures to a greater or less extent the nutritive and stimulating properties of all foods, and consequently the practice of eating daily some fresh fruit tends to establish and maintain good health. It is a long practised custom of civilization to cook food, often to cook it too much. It is then an act of wisdom to neutralize as far as is possible the custom of eating cooked and overcooked food by the consumption of fresh fruit. In this country, more fresh fruit is eaten than in Europe, but there is room for a greater advance in this direction. As said before, conditions such as climate, occupation, and the personal equation must all be taken into account when dealing with the diet question, but it is an axiom that in all climates and in all occupations some fresh fruit should be eaten. Experience backed by scientific investigation has proved this to be true.

INFANT MORTALITY AND ITS CAUSES

It is beginning to be better understood that the majority of diseases which afflict civilized people are preventable. But treatment, or rather preventive measures, must be started very early in life. The most important and earliest measure is that the mother may be able to feed her own child herself and should not resort to artificial methods, however good these may be said to be. In all civilized countries the birth rate is falling.

France has the lowest birth rate and the birth rate of Great Britain is falling steadily. The birth rate of native born Americans, that is, of Americans whose forebears came to the country generations ago, is small, and while the quality may be good, they will be swamped by the numerous progeny of prolific immigrants, if the relative birth rate of the native born and newcomers continues in the same ratio.

One remedy is to save the infants born to Americans by inducing the mothers or rendering the mothers able to feed their offspring in the manner

that nature intended. At the present time, Great Britain presents, perhaps, the best example of a civilized industrial nation of which the birth rate is low and the mortality of infants is higher by far than it ought to be. Also in Great Britain preventive medicine is being practised on a wider scale than in any country. Sir Bruce Bruce-Porter wrote on the subject of infant mortality and its causes in the *Observer,* June 10th last, and pointed out that as the birth rate only slightly exceeded the death rate, no child should be allowed to die from preventable causes. It has been estimated that eighty per cent. of the children born are born free from actual disease, but in spite of this fact figures from the Health Ministry's own publications state that over sixty-one thousand babies died in the United Kingdom in 1918 before their first birthday and over ninety-three thousand died before the age of five.

Another statement emanating from the mouthpiece of the Ministry, Sir George Newman, is even more startling in its sinister significance. This is his estimate that in 1917 one million children were so mentally or physically defective as to be unable to derive reasonable benefits from the education provided for them by the ratepayers. Of course, a good deal of this physical and some of this mental incompetence can be prevented as they fall into these conditions through ignorance on the part of the parents. Therefore money spent on improving the health of the infant, and in preventing disease from developing, would be money saved over and over again at a later stage of this child's life. A child crippled in mind or body is a burden on the community instead of an asset, and as good health means prosperity, effective prevention of disease is an economical measure of the first importance.

A man is either independent and valuable to the nation or a parasite, existing on the work of others, and this statement applies to woman but to a less extent. Moreover, not only is a great deal of valuable time lost through preventable ill health, but half the people of Great Britain die before fifty.

On successful mothercraft depends the production of the sane mind in the healthy body. That is, the mother must be taught to care for her health and instructed how to do this properly. She ought to be able to nourish her child, and generally speaking will be able to do so if she knows how to care for herself during the child's prenatal stage and puts her knowledge into practice. Also, as a rule, the parent must be specially trained to care for the young and should not rely on what is known as "instinct." Early diagnosis is important in childhood, as heart disease for instance from rheumatic fever due to septic foci can be prevented by doing away with the cause.

Dr. Harry Campbell has pointed out many times that after weaning a child should be encouraged to eat and masticate thoroughly hard foods and not be fed on a pappy soft diet when it has its teeth. Too much sugar should be tabooed, as the eating of candy in large quantities is responsible for the early decay of the teeth, for oral sepsis and for disorders of the gastrointestinal tract. The young mother should know something of food values, and should not neglect to give children foods containing a sufficiency of vitamine content. Prenatal care is as essential as postnatal care. If the expectant mother does not care for herself she will produce an ill nourished infant which she cannot feed, and it must be borne in mind that healthy mother's milk contains elements combined in such a way that it cannot be successfully simulated by artificial feeding. An infant fed on its mother's milk starts life with a great advantage. After weaning it is improper food given in too large quantities, at too frequent intervals, that does the harm. The child, like the man, can dig its grave with its teeth and is often encouraged to overeat by injudicious parents. Unlike the man the child is not responsible for its dietetic errors or deficiencies, but its careless or ignorant parents must bear the blame.

IN SUPPORT OF THE NIGHTCAP

The medical profession have always been apt to contract obsessions. A leader of medicine will advocate a certain mode of treatment and the rank and file will frequently follow without a sufficiently due consideration of the circumstances of the case. In scientific diet for some time calories held sway and one's diet was largely ruled by its caloric content. Then it was pointed out that this was not really as it should be and that there was an elusive element of the diet which, although it had never been isolated, was essential to health. The overpowering consequences of vitamines in diet have been so persistently urged that at the present time the man in the street can converse glibly regarding the necessity for ingesting the various vitamines in adequate amounts and in correct proportions. Now, the vitamines are falling into the background somewhat, not that their value is minimized, and the need of the mineral salts in a diet is insisted upon as a primary condition of good health. And so it goes. Several years have passed since the supreme virtues of fresh air, especially in the treatment of respiratory affections, were lauded to the skies in all parts of the civilized world. A cult of fresh air was founded and its professors went to extreme lengths.

Consumptives in sanatoriums spent the day and frequently the night in the open air, as it was held that if they were well covered and their feet were

kept warm that they derived much benefit from this Spartan treatment. It was thought to be the height of effeminacy to sleep in a room in which the windows were closed, and, in fact, the cult of fresh air became an obsession. At first, no doubt, free ventilation came as a healthy reaction from the often stuffy sitting rooms of our ancestors, but the cult was carried too far and there are signs of reaction against the worship of the God of the Winds. In the first place, it has been shown that the evils of vitiated air have been considerably exaggerated, and that while what is termed pure air is more refreshing than a fuzzy atmosphere, that it is really movement in the air that is required.

Not long ago a late surgeon colonel, by name Beevor, of the British Army took his courage in his hands and recommended a return to the extinct nightcap. He propounds the thesis that the modern cult of fresh air has become a fanaticism and that to keep the body warm with quilt and hot water bottle, leaving head and neck icy cold, is to defy the rule of reason. He points out that socalled cold in the head and chill on the liver are the most generally recognized effects of interference with the normal working of the vasomotor nerves. Moreover, he does not agree that all colds in the head are due to infection, and considers that this theory has contributed to a dangerous belief in the benefits of pure air under any conditions.

Air needs to be of a temperature which will not interfere with the normal powers of the vasomotor nerves. Also, during sleep our vitality is at the lowest and he wishes to draw attention to the error of their ways of those well meaning but misguided people who pride themselves upon being fresh air fiends and sleep with a cold current of air in their bedrooms, even take their meals under similar conditions, and hopes to dissuade from adhesion to the fallacy that cold fresh air is a panacea for all catarrhal diseases.

Beevor largely bases his views on his experience as a medical man in the army, in which capacity he has been frequently and specially impressed by the baneful effects of a compulsory adoption of the fresh air cult carried to the extreme by soldiers on active service. He found that in the northwest frontier of India in regions in which the white man had never trod, where the air was pure as crystal, and the ground on which they rested was virgin rock, that colds among the soldiers were common. Almost similar phenomena were observed in the desert of the Upper Nile and of the Eastern Soudan, and these experiences shook his faith somewhat severely in the constant infectivity of colds and of the efficacy of preventive treatment by a copious and continuous supply of fresh air, however chilly it might be. For these reasons he thinks that our forbears had a certain degree of scientific sense in the adoption of the nightcap, and that it only required common sense to decide when to use it and when not.

It is an axiom, or should be, that a custom which endured for generations possesses some accruing advantage. The nightcap was worn throughout Europe for centuries. Chaucer referred to it in *Merchant's Tale* five hundred years ago. Possibly Mr. Pickwick's nightcap in that famous episode at the Great White Horse at Ipswich was the last time that style of headgear was mentioned in literature. Soon after that famous misadventure the nightcap went out of fashion, and doubtless Beevor's plea for its restoration in certain circumstances will have no more effect than that of Macaulay in Mid-Victorian times. Its day had passed and it had become an object of jest. Attention may be directed to one point, namely, that when nightcaps were common bedrooms were not scientifically heated and the four-post bedsteads with curtains and nightcaps for the occupants were more needed in the chillier and draughtier rooms of our forbears. But in the light of modern medical science there is sound reasoning in the argument of the British army surgeon that there are times when nightcaps may play an effective rôle in the prevention of disease.

MAIL FRAUDS

What affects one's purse is considered of vital moment compared with influences derogatory to life and health. This is well illustrated in the origins of war, for in modern national murder, at least, the chief exciting causes are commercial interests and the lives and health of thousands are sacrificed without mercy upon the altar of the money god. In the middle ages wars were waged more openly for commercial ends and they were more humane. The weapons were less deadly, and the prisoners were held at ransom (by which the victor made his money) according to rank and title. The rich man suffered according to his riches.

Our laws in regard to use of the mails may seem a long way from wars, ransoms and the like; nevertheless, a man may not, with impunity, use, in certain ways, the postal machinery to filch from his fellows their hardearned cash, but he can use it to hazard their life and health. The advertisements of cures, drugful or drugless, have free access to the mailbags and may menace health with slight concern on the part of anyone.

Books are denied access to the mails when they are supposed to corrupt the moral nature, but if they threaten indirectly the life and health of the reader, it seems of small matter. Our attention has been

called to a publication which, so far as we know, has the freedom of the mails. It is a socalled health book for laymen and the title is *Health via Nature*. So far as this title is concerned, there certainly is nothing to be complained of. In fact, we are unaware that health came by any other means. But the book is not devoted so much to health as to the cure of disease "by natural methods." Among these natural methods are high and low enemas, electric cabinets, etc. For sunstroke one should "dilute" the rectum. Harmless enough, this latter, but hardly "natural." But in diphtheria the recommendation is: "to loosen the false membrane and to get it to slough away, have the patient inhale steam through the nozzle of a teakettle." Of course there is no mention of antitoxin (save to decry the use of all serums), for "errors in eating and drinking no doubt are the source of diphtheria." Consumption is caused by "too rich diet," and the author is consistent in having the patient use milk, cream, butter, and eggs sparingly. "All milk should be diluted, half milk and half water." The patient must also avoid too starchy and too sweet foods, but as he must live chiefly on "fruits and whole grains" he will be in somewhat of a dietary dilemma.

Yet all this stuff can travel in the twentieth century as parcel post mail wherever it will in these enlightened United States.

THE PROGNOSIS OF APHASIA

It is hardly necessary to say that the prognosis in a case of aphasia in the first place depends upon the causal disease, but this is not the only factor to be taken into account. Moreover, great importance is to be attributed to the variety of aphasia. When it is motor in type, it has a greater tendency to retrogress than when it is of the sensory type. And nevertheless, in the initial phase, the aspect of a major anarthria appears much more alarming than that of an aphasia of the Wernicke type, because in the first type the patient remains conscious, while the subject afflicted by the second type does not appear to possess sufficient mental vigor to be reeducated. The extent of the lesions is important, although extensive destruction of the speech area may only be accompanied by minor disturbances.

The age of the patient is an element of prognosis to be most attentively considered. Aphasia in childhood is rare, and then only met with in subjects of eight or ten years, the process progressing rapidly toward a favorable outcome. In adolescents—in whom arterial lesions do not exist as a general rule —the aphasia retrocedes easily, without leaving any trace behind. In adults the lesions of syphilitic arteritis are apt to be the causal factor and with a properly applied antisyphilitic treatment the situation may be greatly ameliorated. In elderly subjects the prognosis unquestionably is gloomy, because even a mild aphasia is frequently accompanied by a marked intellectual deficit. The lesions of senile arteriosclerosis have no tendency to spontaneous repair and frequently an aphasia, which at the onset was mild, progressively proceeds to dementia, with all its unfortunate complications.

All things considered, the notion of the state of the intellect has become capital in importance at the present time in respect to the prognosis of aphasia. In point of fact, it is with what remains of the intellect and by a constant effort of the will that the patient may little by little recuperate a propor functioning of the automatism of speech.

Obituary.

SIR G. ANDERSON CRITCHETT

London

Sir George Anderson Critchett, Bart., K.C.V.O., surgeon oculist in ordinary to the King, passed away on February 9th, in a nursing home in London. It frequently happens that to be the son of a distinguished father is a serious handicap. Sir Anderson Critchett's father was perhaps the best known British ophthalmologist of the day, but this fact only acted as a spur to the son. He became perhaps the leader of ophthalmic surgery owing to his great skill as an operator and to his dominating personality. Indeed, his manipulative skill in eye surgery was a byword in the profession and he won the admiration of men whose own achievements in the same field made them peculiarly well qualified to judge. Especially he was regarded as one of the finest operators who ever dealt with cataract. In this connection it may be mentioned that writing on this subject in his *Archives of Ophthalmology,* Knapp, of New York, declared that in his opinion Critchett's method of operating for this condition eclipsed all others. It has been generally adopted by ophthalmic surgeons throughout the world.

Sir Anderson was seventy-nine when he died. He was ill for less than a week and almost to the end he was working with all the keenness that characterized his prime. He received part of his medical education at Caius College, Cambridge, and part at Middlesex Hospital, London, and in Paris and Germany, qualifying in 1872. Much of his work was done at St. Mary's Hospital, to which he became consulting ophthalmic surgeon. Up to 1881 he was attached to Moorfields, the special eye hospital of London, and to the Royal Free Hospitals. He was senior ophthalmic surgeon to King George's Hospital. In 1901 he was appointed surgeon oculist to the late King Edward, and in 1910 surgeon oculist to King George, becoming surgeon oculist in ordinary to the King in 1918. The honor of Knighthood was conferred upon him in 1901, he was made a baronet in 1908, and K.C.V.O. in 1919.

News Items.

Harvey Society Lecture.—Dr. Wilhelm Kolle, professor of medicine, University of Frankfurt am Main and director of the State Institute of Experimental Therapeutics, will deliver the eighth Harvey Society Lecture at the New York Academy of Medicine on Saturday evening, April 18, 1925. His subject will be "The Abortive Cure of Syphilis in the Light of Experimental Studies."

Memorial to Doctor Berens.—In memory of Dr. T. Passmore Berens, for thirty-three years connected with the Manhattan Eye, Ear and Throat Hospital, a tablet has been erected at the hospital.

Lectures at Columbia.—The Columbia University School of Medicine has decided that clinical lectures of the third and fourth year will hereafter be open to the general medical profession.

Honorary Degrees from Dublin University.—Dr. Charles H. Mayo, of Rochester, Minnesota, and Dr. George W. Crile, of Cleveland, Ohio, have received the honorary degree of master of surgery from Dublin University, Dublin, Ireland.

Postgraduate Courses.—The University of Pittsburgh Medical School announces a two weeks postgraduate course for the general practitioner, and a third week of laboratory instruction if desired, to begin June first. The cardiovascular system will be dealt with in particular.

"Hospital on Wheels."—A bill has been proposed in the Illinois legislature for a railway coach to be fitted with modern hospital conveniences and to provide quarters for disaster relief workers. The coach would be kept in Springfield, which would enable it to reach any point in the State in six hours. An appropriation of $60,000 is requested.

Health Institute at Portland, Maine.—The New England Health Institute will be held in Portland, Maine, from May 4th to 9th, under the auspices of the U. S. Public Health Service, the New England State Health Departments, Yale, Harvard, Massachusetts Institute of Technology, and Simmons College. The only expense is a registration fee of one dollar.

International Health Delegates.—A group of delegates from Latin American countries, under the International Interchange of Health Officials, part of the activities of the League of Nations, are in this country, their itinerary being arranged by the Surgeon General of the Public Health Service. The date of the arrival in Washington is April 6th, and Baltimore and New York will be visited.

French Tuberculosis Study.—The *Association Alsacienne et Lorraine Contre la Tuberculose* announces a postgraduate course in the study of tuberculosis, to be given by the faculty of Medicine of Strasbourg, from October 9th to 24th, at the University. The fee is two hundred francs. Information may be obtained from Dr. Vaucher, rue de l'Université et 8, quai Finkwiller, Strasbourg, 22, France.

Papers on Neurology.—The Section of Neurology and Psychiatry of the New York Academy has arranged the program for the stated meeting, April 16th. The following papers are to be presented: "Ultimate Cause of Most Hemiplegias" by Dr. Thomas F. Reilly; "The Proper Classification of the Cerebral Palsies of Early Life," by Bernard Sachs; and "Static and Kinetic Representations of the Efferent Nervous System in the Psychic Sphere," by Dr. J. Ramsay Hunt.

Civil Service Examinations.—The U. S. Civil Service Commission, Washington, D. C., announces examinations for junior medical officer, assistant medical officer, associate medical officer, medical officer, and senior medical officer, for vacancies in various branches of the Government service, at entrance salaries from $1,860 to $5,200. Applications should be received before June 30th; competitors will not be required to report for examination at any place, but will be rated on education, training, and experience.

Examinations for entrance into the regular corps of the U. S. Public Health Service will be held June first at Washington, Chicago, New Orleans, and San Francisco. Applicants must be between twenty-three and thirty-three years of age, graduates of medicine with one year's hospital or two years' professional experience. Oral, written, and clinical tests and a physical examination will be required. Applications should be addressed to the Surgeon General, U. S. Public Health Service, Washington, D. C.

Benefit for Physicians' Home.—The Century Theatre, where "The Love Song," with music from Offenbach, is being given, has been secured for a benefit performance for the Physicians' Home, on the night of Monday, April 20th. Physicians purchasing two or more tickets for box seats, orchestra, or dress circle, will receive membership certificates for 1925. The Physicians' Home is an organization for help to physicians who through age or illness, need assistance. Tickets may be obtained by mail from the secretary, Dr. Silas F. Hallock, 901 Lexington Avenue, New York.

Montefiore Hospital Anniversary.—Montefiore Hospital for Chronic Diseases, New York, held its fortieth anniversary on April 5th. Dr. George E. Vincent of the Rockefeller Foundation gave an address on "The Hospital and the Community," and S. G. Rosenbaum, president, read a report tracing the history of the hospital, planned in 1884, in commemoration of Sir Moses Montefiore who was then alive, and celebrating his hundredth birthday. A tribute was paid to the late Jacob H. Schiff, who was on the first board of trustees, and who was president for thirty-five years. The first building of the hospital was at Eighty-fourth Street and Avenue A, where a building with space for twenty-six beds was leased for thirty dollars a month.

Personal.—Dr. Ernst P. Boas of New York spoke on "The Clinical Significance of Recent Studies of the Capillaries" before the Buffalo Academy of Medicine, April 8th.

Dr. Wade H. Brown of the Rockefeller Foundation recently lectured on "Chemotherapy and Treatment of Syphilis," at the University of Michigan.

Dr. Frederic W. Bancroft of New York has been appointed surgical director of the Lincoln Hospital and Home.

Dr. Fred H. Albee of New York gave an address and held an operative clinic before the Fulton County Medical Society, of Atlanta, Georgia, on the occasion of the opening of the Atlanta Graduate School of Physicians and Surgeons.

Dr. Philip Horowitz of New York spoke before the Dauphin County Medical Society, Harrisburg, Pennsylvania, on "Present Concept of the Use of Insulin in the Treatment of Diabetes."

Postgraduate Clinic Tour.—The Interstate Postgraduate Assembly, directed by the Tristate District Medical Association, announces that there are still some vacancies for physicians desiring to take advantage of its foreign tour. This tour includes clinics in Toronto and Montreal in this country, leaving Montreal May 23d, and clinics will be held in Liverpool, Manchester, Leeds, Dublin, Belfast, Glasgow, Edinburgh, Newcastle-upon-Tyne, and Paris. Dr. Charles H. Mayo will be presiding officer of the tour, and Dr. William B. Peck, of Freeport, Illinois, managing director. Clinic space has been planned to accommodate five hundred physicians, and two one cabin ships have been chartered for passage. The trip can be arranged at less than one thousand dollars. Reservations accompanied by a fee of sixty-five dollars to hold space should be sent to Dr. Peck.

Opportunities for Graduate Medical Study in New York.—The Committee on Medical Education of The New York Academy of Medicine has prepared a series of synopses of approved opportunities for graduate medical study in New York City which will soon be published for distribution. The synopses cover dermatology and syphilology, obstetrics and gynecology, internal medicine, neurology and psychiatry, ophthalmology, otolaryngology, pediatrics, surgery, urology, and orthopedic surgery.

A Bureau of Clinical Information is maintained at the Academy of Medicine, 17 West Forty-third Street, where detailed information is available regarding, opportunities for graduate medical study in New York, and also in other cities of the United States and abroad. The executive secretary in charge of the Bureau is prepared to answer inquiries concerning ordinary internships, special internships or residencies, graduate courses in medical schools and teaching hospitals, and extension courses. Much information in regard to graduate medical work in England and on the Continent is on file.

The bureau publishes a *Daily Bulletin of Surgical Clinics* which will be mailed free to visiting doctors on request. *A Weekly Bulletin of Medical Clinics* also is published. A book of the fixed clinics of Greater New York, with a transportation guide, has been prepared for the use of visitors whose stay in the city is limited, and is furnished without charge.

Foreign Correspondence.

LONDON LETTER

(From our own correspondent)

London, *March 7, 1925.*

EPSOM COLLEGE WAR MEMORIAL

Epsom College is an educational institution founded in 1855 by Dr. John Propert with the intention of constituting a foundation for fifty boys, the children of medical men, where circumstances had precluded the boys from the opportunities usually enjoyed by the sons of the professional classes. Briefly stated the Royal Medical Foundation of Epsom College exists, first, to give pensions to fifty aged or disabled medical men or their widows, and, second, to provide, free of charge, a good public school education, together with clothing, maintenance and pocketmoney, to fifty sons of deceased or disabled medical men. Last year, generous benefactions had so increased the value of many pensions that the college bestowed no fewer than one hundred and sixty-six pensions. However, it is the educational work which arouses the widest and warmest sympathy. There is keen competition for the fifty foundation scholarships, which have given chances in life to many poor boys who otherwise would have lacked the advantage of a first class education. Over and above these fifty foundation scholarships, the college offers privileges to the sons of medical men who are provided with a public school education at as near cost price as possible. While Epsom College has developed into a first class public school, second to none in this country, it should not be forgotten that the prime reason for its foundation was to benefit medical men and their families and it may be added that it has fulfilled this, the true object of its founders, in the most highly satisfactory way.

Among the early benefactors of the college were the proprietors of the *Lancet,* who when the scheme was mooted sent £1,000. Epsom College has prospered exceedingly, and in the great war one thousand of its old boys joined the colors, of whom one hundred and forty gave up their lives. In memory of these brave men the chapel has been added to, in fact, transformed at the cost of £11,500. Towards this memorial fund Lord Rosebery, president of the college, has given £1,000, and the other subscribers have been mainly the relatives of the fallen, and old boys and parents of boys now in the school. On Saturday, February 21st, amid impressive ceremonial and in the presence of a distinguished congregation, the Bishop of Winchester consecrated the reconstructed Epsom College Chapel. It should be explained that a public school here does not mean the same as in America. In this country the public schools are for the education of the prosperous and professional classes.

SIR CLIFFORD ALLBUTT

Although Sir Clifford Allbutt, regius professor of physics in the University of Cambridge, had reached a green old age, his mental faculties were so alert that no one regarded him as an old man. Only three days before he passed away the *Lancet* received from him a letter, published in its issue of February 28th, which showed that his mind was as agile and his reasoning power as logical as ever. A friend of the writer also had a letter from him written at about the same time promising his support of a candidate for a foundation scholarship at Epsom College.

Sir Clifford Allbutt was the acknowledged leader of the British medical profession and was chiefly distinguished by his unrivalled clinical experience and acumen, by the remarkable literary powers, and by the successful manner in which he dealt with men and things. He was a scholar, a literary man and a great physician, and at the same time eminently practical. He shone in whatever branch of medical science he took up. For instance, he was a conspicuous success as a Commissioner of Lunacy. No doubt, however, the Regius Professorship of Physic in Cambridge University was exactly suited to his genius and bent of mind.

While he was fifty years of age at the time of his appointment, he quickly adapted himself to the academic life. He was an extraordinarily versatile man, a good classical scholar and as said before a writer of rare distinction. When in Leeds he lived not far from the dwelling place of that tragic family of geniuses, the Brontes, with whom he was connected by family ties. The Miss Wooler to whose school Charlotte Brönte went, and in whose school Charlotte Brönte taught for a time, was related to Sir Clifford Allbutt. Charlotte Brönte and Sir Clifford were friends and when she, the last and greatest of that ill fated family of conspicuous abilities, died, she left the manuscript of some of her books to Sir Clifford, who placed them in the Fitzwilliam Museum in Cambridge. He also knew well George Eliot and other giants of literature of the Victorian era. We shall never look upon his like again, at once highly cultured, deeply scientific and above all practical in that he was strongly conscious of the immense value of clinical experience. In appearance he resembled that prince of diplomats, the Earl of Dufferin, and courtly in manner, almost exuded graciousness and kindness.

Sir Clifford was liked and respected by all with whom he came into contact and loved by his friends.

DEATH OF DR. GEORGE SIGERSON

At a ripe old age a celebrated scientific medical man and a man of varied literary interests died in Dublin on February 17th, last, in the person of Dr. George Sigerson. He was a pioneer in Ireland in the modern treatment of nervous diseases. He had been a pupil of Charcot.

Dr. Sigerson was as well known in politics as in medicine and was the writer of an article which appeared in one of the leading nationalist journals of the time of which the notorious Pigott, the author of the forgery in the *Times* with reference to Parnell, was the editor. Pigott was sentenced to twelve months' imprisonment for publishing the article and afterwards comitted suicide when his forgeries in the Parnell case were discovered. Sigerson was a man of wide learning but essentially a student and although he took a somewhat prominent part in the nationalistic affair of Ireland was what used to be called in Germany "a revolutionary of the chair." He was not known to the man in the street. He was an idealist, almost a visionary, and on account of his

indifference to the material side of life, it occurred that the possessor of the most brilliant and best equipped medical mind in Dublin was a failure from the worldly point of view. Sigerson's knowledge was remarkable. He spoke French as a Frenchman and he knew German, and was one of the few men who really knew the language, the literature and the history of his own country. He was a journalist of the most brilliant type, he wrote concerning the results of microscopic investigations, of heat as a factor in vital action of the buoyancy of bodies of greater density than water, of flowers and advances in botany.

He translated Charcot on the nerves and wrote on paralysis and the geographical changes in the soil of Ireland. Perhaps, however, the best work that Sigerson did were his books on Irish history and literature. Sigerson was a professor of biology and a practising physician but was an academician who lived an isolated life and appeared to regard the tremendous happenings of his day somewhat with the ironic and detached air of a scientific onlooker. His writings on political questions show that he took a keen interest in them, and it is likely that under an impassive and reserved manner he concealed the strongest feelings that his seeming detachment was due to the fact that he knew that the majority of those who read the writings did not understand them. It was an intellectual superiority which cannot but breed a certain amount of contempt for those lacking in knowledge. Dora Sigerson, who inherited her father's mysticism, was a well known writer of poetry. She married Clement Shorten, the famous English journalist, and died in 1915.

DISEASES OF THE CLIMACTERIC IN BOTH SEXES

At a meeting of the Chelsea Clinical Society, held at St. George's Hospital on February 17th, Sir Thomas Parkinson opened a discussion on diseases of the climacteric in both sexes. He drew attention to the changes that accompanied this period of life in men. Many men at this time of life showed changes in arterial tension with or without renal changes. He pointed out the uselessness of attempting to reduce the blood pressure in these cases by means of drugs and said that alteration in the surroundings of the man, with lessened diet and rest in bed were the chief assets in securing relief. In the female the flushings experienced at the climacteric were, he thought, due to the loss of ovarian secretion, and this loss upset the action of the thyroid and adrenals. At this period of life in both sexes the endocrine organs were very erratic. He considered the upset of the normal mental condition was due in many cases to the thyroid. The cause of the excessive headaches was possibly due to affections of the pituitary gland. It was important that men should be treated before definite changes had been established in the vascular system. He thought that people of both sexes ate far too much at all times, and that such excess was most harmful at this period of life.

Mr. A. Ralph Thomson put the age of the climacteric as from about fifty-five to sixty-three years in the male. He showed that sepsis was more common in the male sex than in the female at about this time of life, and that the chief septic changes were associated with gangrenous or necrotic processes. Mr. Thomson commented on certain clinical facts he had observed in connection with cancer of different parts of the body. He had noted the curious absence of bloom from the complexion of the face in cases of malignant disease, which he compared with the absence of bloom observed on the leaves of plants grown under calcium free conditions. In his experience the thyroid was enlarged in not a few cases. Some of the thyroids in malignant disease that had come under his view were very large. Acting on these observations he had been used to prescribe calcium and thyroid, and he gave an interesting account of some cases of inoperable carcinoma of the bladder, in which some improvement had been seen after this treatment.

Dr. Theodore Hyslop pointed out that many men exhibited psychical symptoms at about the age of fifty, and he thought that this was associated with the periodical holding up of uric acid in the system. He advocated saline purges for this condition with diaphoresis.

LATIN AMERICA LETTER

(From our own correspondent)

BALBOA HEIGHTS, C. Z., *March 10, 1925.*

PHYSICIAN INTERCEDES IN INDIAN UPRISING

Dr. John G. South, formerly of the State Board of Health of Kentucky and at present Minister to Panama from the United States, is now in the San Blas Country of Panama conferring with the Indian chiefs of the San Blas tribes relative to their recent uprising against the Panama Government. Several weeks ago there was reported a serious massacre of the Panama garrison of military police stationed on the Islands. During the fighting there were twelve Indians and twenty-two Panamanians killed. Upon receipt of the report the Government of Panama sent a detachment of troops to the aid of the rest of the garrison and at the same time Doctor South sailed for the scene of hostilities on the U. S. cruiser *Cleveland*.

Following a lengthy interview with the San Blas chieftains at Carti, the Indians promised Doctor South that they would stop hostilities provided the Panama forces would not attack them. It is reported that the massacre was incited by a proclamation of independence promulgated by an American, R. O. Marsh, the discoverer of alleged white Indians in that country.

An editorial comment of the *Star and Herald* of Panama makes the following statement: "If it were not for the tragic consequences, the 'San Blas declaration of independence' as composed by 'explorer' Marsh would be almost sufficiently amusing to compensate one for wading through its great length. It is to be regretted that this trouble could not have been anticipated and the cause for grievances of the San Blas Indians investigated and removed as nearly as possible in the circumstances, and to that extent there is the responsibility for furnishing the powder, but the responsibility for touching it off would appear to rest with R. O. Marsh, judging entirely from the document that bears his initials."

It will be remembered that there was reported

previously in these columns the "discovery" of white Indians by R. O. Marsh, who took four of these to the United States in an endeavor to prove his claim. Marsh, it is reported, is at present on board the *Cleveland* under the protection of the American minister.

The San Blas Indians are usually peaceable by nature and have been in communication with civilization for some time. They have, however, one peculiar superstition persisting. No white man is allowed to stay on their island over night, for to do so would produce a spell of the evil spirit upon them. Hence all white people visiting the islands must at nightfall return to their vessels.

FURTHER STUDY OF SAN BLAS SOCALLED WHITE INDIANS

Dr. R. G. Harris, director of the Biological Laboratory of the Long Island Biological Association, has just returned from San Blas Islands, where he has been carrying on intensive studies of the socalled white Indians inhabiting these islands. In discussing his studies, Dr. Harris pointed out that true albinos whether in men or animals, have pure white hair and pink eyes. But the blond Indians of San Blas have hazel eyes and flaxen or auburn hair. The blond Indians form a greater proportion of the population of the region than albinos which are known in other regions of the world. Dr. Harris has collected data which he thinks will show conclusively that this partial albinism is inherited and that it runs in families and whereas there is not yet a race of white Indians, the present partial albinos hold potentialities which under favorable conditions may be turned to race production.

Previous to his visit to San Blas Dr. Harris made a large collection of tropical insects of Panama for the museum of the Biological Laboratory and also carried on investigations on the caterpillar of the moth hawk, the most destructive insect in this section.

NATIONAL MEDICAL CONGRESS OF CUBA

During the year 1924, Havana, Cuba, has been the seat of not a few scientific congresses. The two most notable of the year were the Pan American Sanitary Congress and the Cuban National Medical Congress. Both of these were well attended by many notables from the United States. Over one thousand persons attended this last congress and among the most noted were Doctors Gant and Fox and Andrews. Dr. F. M. Fernadez, the Secretary-General of the present congress was elected president for the ensuing year. Many features of importance to Cuba were taken up at the meetings, including resolutions recommending legislation for the proper control of immigration, improved food and drug control and the inauguration of a Health Officer's Training School. There were also passed resolutions for the establishment of laws for the protection of the public against quackery and nostroms.

PUBLIC HEALTH CONGRESS OF BRAZIL

The second Public Health Congress of Brazil was held during the month of December, 1924. Many subjects of vital importance to that Republic were discussed. Among them the most important was, epidemiology, rural sanitation, with reference to the control of hookworm and malaria with the eradication of this latter disease through anti-malarial sanitary work. Attention was also called to the very meagre reports on vital statistics from the rural districts and the great need for the establishment of a more improved system of collection.

Interest was displayed in the section of child hygiene. It appears that more thought is being given to this important subject by the Public Health Officials of South America in general. Many papers were read on school hygiene and the establishments of proper standards for this work. The substitution for theoretical teaching of hygiene by practical methods was discussed at great length. Suggestion was made of the addition of a school hygiene department to the National Public Health Service.

HEALTH CENTRES OF THE ZONE REOPEN

The Health Department of the Canal Zone announces the reopening of health centres in Ancon and Balboa for the benefit of the children living on the Pacific side. These will be open twice a week and in charge of a physician and a public health nurse. Stress is laid upon the fact that while these are for the benefit of children of all ages mothers are particularly requested to bring their infants and children of the preschool age. It is the desire of the health department to secure accurate records of all the children of the Zone with the view of improving their health so that when they enter school they will be as free as possible from remediable defects and in a condition to meet the new environment with the least impairment to their physical condition. Dr. George Eugene, of Ancon Hospital, and Miss Katterine Luby, the Public Health nurse, will have charge of the centres.

AN UNUSUAL ACCIDENT

Of great medical interest is the unusual accident that befell a sailor of the S.S. *Swiftscout,* which transited the Canal a few months ago. Falling overboard from the ship at sea, bitten through the left leg by a shark, and fighting his way through a rough sea and a treacherous current off the Island of Taboguilla and remaining on the island for three days without food, is the harrowing experience of George Wickey, chief cook of the ship.

It appears that after shore leave Wickey returned to his ship at the Balboa docks at midnight and then went to sleep on the poop deck. The ship put to sea without his awakening and the next thing he knew he was in the water struggling and calling for help as the ship passed out of sight. On his right he could make out a light and toward this he started to swim. In a few moments he was grabbed by some monster of the deep, possibly a shark, which inflicted deep lacerations in his left leg. In his struggles he managed to kick, which broke the hold of the fish. It then disappeared and did not attack him again. He continued to swim, although in great pain from his wounds, and after a battle with the waves for three hours landed in an exhausted condition on the rocky shore of Taboguilla. While swimming he divested himself of all clothing except his singlet. Tearing the hem off this he tied it around his leg to stop the flow of blood. After being cast up on the shore, and just as dawn was breaking, he fell asleep. Here for three days without food or cloth-

ing he braved the elements. This island is uninhabited and he was rescued by fishermen who brought him to the Canal Zone, where he was taken to Ancon Hospital for treatment. The man was suffering intensely from infection of the wounds and from severe sunburn when he arrived at the hospital. During his stay double pneumonia and pleurisy developed. The bites from the fish severed some of the nerves. The man is still in the hospital making slow convalescence.

SANITARY TREATY BETWEEN COUNTRIES OF SOUTH AMERICA AND UNITED STATES APPROVED

Word has been received that the Foreign Relations Committee of the U. S. Senate has approved the conventions between the countries of South America and the United States providing for uniform regulations governing ports and shipping to prevent the spread of disease. The conventions of the treaty are in the main the result of the different resolutions adopted at the various Pan-American Sanitary conferences throughout a number of years. The culmination of these took place at the Seventh Pan-American Sanitary Conference held at Havana, Cuba, last November. The authority under which the Sanitary Code was drafted is as follows:

WHEREAS, The various international conferences of American States have adopted recommendations or resolutions relative to: a, The general welfare of the Republics of America; b, Sanitary policy and the means of preventing the introduction and propagation of communicable disease; and c, The means of promoting international commerce; and

WHEREAS, The various international sanitary conferences have adopted numerous resolutions and recommendations and have signed a convention for: a, Preventing the propagation and suppressing communicable diseases; b, Quarantine, fumigation, disinfection, and methods of inspection regarding vessels engaged in international commerce; and

WHEREAS, Modern quarantine methods and procedures have advanced to such a point that if uniform systems are employed a maximum of protection may be obtained, with a minimum of delay for commerce, therefore be it

RESOLVED, That the International Sanitary Office be entrusted with the preparation of a project of International Code of Maritime Law, which the Seventh International Sanitary Conference to be held at Havana at a date to be fixed during the year 1923 shall study, approve, and adopt in the form of a treaty.

For the United States, Surgeon General Hugh S. Cumming and Assistant Surgeon General John D. Long of the U. S. Public Health Service have been for the past few years industriously working upon the code and the approval of the conventions are in part due to their labors.

CANAL ZONE MEDICAL ASSOCIATION

The 218th meeting of the Isthmian Canal Zone Medical Association was held on Tuesday, February 17, 1925, at the Century Club in Panama. The association was the guest of the Herrick Clinic, which has a fine hospital and clinic in Panama City.

EXPLOSION AT BARBADOS RESULTS IN FOUR DEATHS

Information received on the Isthmus during the month conveys the sad intelligence of an explosion which occurred in the harbor of Barbados on a Canadian steamer, February 19th, when four laborers were killed outright and many injured. A fire broke out in hold No. 2 and gradually worked its way to a cargo of five hundred barrels of gasoline. Impossible to control the fire, she was towed to sea, where the ship was completely demolished.

NARCOTIC SMUGGLERS APPREHENDED

For the past few months unconfirmed reports have reached the health department of the smuggling of narcotics into the Canal Zone. Due to the activity of the Customs service, Manuel Beana, of Colombia, was recently apprehended, tried and sentenced to ten years in the penitentiary at Gamboa on the Zone. He was in addition fined $500. This is the maximum penalty for dope smuggling. It is thought that Beana is the ringleader of a gang.

QUARANTINE AGAINST BRITISH HONDURAS LIFTED

Owing to the fact that the Stanncreek District of British Honduras has been free from yellow fever for the past several months, Surgeon C. P. Knight, chief quarantine officer of the Panama Canal, has issued an order raising the quarantine on account of yellow fever against the ports of British Honduras.

Letters to the Editor.

DIATHERMY IN CARDIOVASCULAR DISEASE

NEW YORK, *March 23, 1925.*

To the Editor:

May I invite attention to an error of assumption in the otherwise excellent paper of Dr. Baruch Last on the Use of Diathermy in Cardiovascular Diseases, published in your issue of February 18, 1925?

In two places he speaks of the blood as being more heated than the rest of the tissues by diathermy and speaks of axillary temperature being higher than rectal in general diathermy as a proof. First, high potential currents pass through substances resistant to low voltage currents. Then Joule's law cannot be set aside even in living tissue. The heat generated is always proportional to the resistance of the circuit; hence bone will heat up more than muscle and muscle than blood. The heat generated is equal to the square of the amperage, double the amperage and you quadruple the heat, and the heat generated is proportional to the time of current flow.

If the two terminals of the d'Arsonval or Tesla coils be attached to electrodes on separate ankles, a thermometer in the rectum will show a decided rise in temperature. The same thing may be observed when the electrodes are placed on abdomen and sacrum.

The reason the blood is hot is because it is draining a heated area, just as water from a boiler is hot (it is conducted heat), and so it circulates giving off its heat by radiation through evaporation of perspiration and lung vapor and by conduction to other organs. If the blood did not circulate through the heated area the tissues would remain hot and be damaged. For this reason diathermy in scar and fibrotic tissue which has poor circulation that cannot be increased, and in anesthetic areas where reflex hyperemia cannot be excited, is to be used with extreme caution and in small doses. The greatest heat in Dr. Last's technic would be near the back. The relief of tension is evidently due to the relief of spasm of the vasa vasorum which may result from the same cause or the analgesia or may be due to the effects of heat.

FRANK THOMAS WOODBURY, M.D.

Book Reviews

MEDICAL EDUCATION

Medical Education. A Comparative Study by Abraham Flexner. New York: The Macmillan Company, 1925.

As indicated by the author in his preface, the volume under consideration is devoted to a comparative study of medical education—and, the reviewer may add, of preparatory training, both general and special—in certain European countries and America as influenced largely by the general educational and social systems of the respective countries. Flexner finds fault with the lack of thoroughness in much of the teaching in primary and secondary schools of this country. It is his opinion that "the best schools are somewhat superior in the cultural quality of their student body to the inferior schools; but even they fall below the European level. Those who question this opinion may satisfy themselves by comparing the current literature of medicine and surgery in various countries in respect to vigor of expression, background, range of acquaintance with medical history, and other criteria, calculated to disclose not only technical mastery but general training." To this dictum the reviewer begs, respectfully, to demur. It may apply to the average of our extremely large output of scientific literature; it most certainly does not apply, in his humble opinion, to the best done here compared to the best done abroad. But be that as it may, there is no question about the truth of Flexner's statements as to the defects of our educational system. For that reason, as well as for the exceedingly able presentation of a most important pedagogical study, his book will be read with interest as well as with profit by educators lay and medical.

THERAPEUTICS

A Textbook of Practical Therapeutics. By Hobart Amory Hare, M.D., LL.D. Nineteenth Edition. Philadelphia: Lea & Febiger, 1925.

The reviewer has long agreed with the author of this book on the importance of therapy. It is a major medical subject, and the object for which a patient comes to a physician. Therapy does not mean drugs only, but any method of treatment, including surgery, that will cure or help a patient.

This book aims to teach the subject of treatment broadly and to help the student and physician to think before he dogmatically uses a drug or physical treatment. The word empirical has been scoffed at and much misused, but when long and careful clinical observation has shown a drug or treatment to be of value in a certain condition, it becomes rational treatment, even if its exact action in the body is not known. Many empirically used drugs have become rational and even specific by later laboratory investigations; as instances, codliver oil, quinine, and mercury may be mentioned.

In the author's classification of drugs, page 55, he still perpetuates the heading of "alteratives," which could well be eliminated and the drugs classified by their actual uses or activities. The part of the book devoted to the alphabetical description of drugs is, as usual, well written and terse. The description of alcohol shows it is a drug of value in proper cases, and because it is under a ban as a beverage is no reason for abandoning it as a drug. The newer drugs have been added and their action described. Quite a number of the useless drugs might be eliminated, although the author aims to explain even ancient things. A few of those that might be eliminated are, agaricin, ammonium valerate, azederach, columba, camphoric acid, catechu, conium, Hoffmann's anodyne, Hope's camphor mixture, hypophosphites. Hypophosphites have no activity whatever. The value of preparations of them is in the other ingredients which such preparations contain.

The parts of the book devoted to remedial measures other than drugs and to foods and diets is excellent as usual.

Part IV, devoted to suggestions for the treatment of different diseased conditions, is arranged alphabetically, as is the rest of the book, and gives ready reference for authentic treatment of disease and diseased conditions. Two carefully prepared indices make the book valuable for cross references.

The type is just right, and the make up of the book splendid.

ALOPECIA

Sammlung zwangloser Abhandlungen aus dem Gebiete der Dermatologie und Syphilidologie. Mit besonderer Berücksichtigung der allgemeinärztlichen Praxis. Herausgegeben von Prof. Dr. J. Jadassohn, Breslau, und Prof. Dr. F. Pinkus, Berlin. III Band, Heft 1. Der Ausfall des Kopfhaars und seine Behandlung. Von Prof. Dr. med. Felix Pinkus, in Berlin. Neue Folge, Heft 5. Beziehungen der ekzematösen Erkrankungen zu inneren Leiden. Von Hofrat Prof. Dr. S. Ehrmann, Wien. Halle a. S.: Carl Marhold Verlagsbuchhandlung, 1924.

The monograph by Pinkus deals with the various types of alopecia and their treatment. After discussing the fetal growth of hair and its anomalies, the residual scalp hair and its disappearance, acute alopecia, mixed alopecia, chronic alopecia, sclerotic alopecia, and the length and pigmentation of hair, acute alopecia due to erysipelas, local depilation and syphilitic alopecia are discussed. Acute alopecia not due to inflammatory changes in the scalp (alopecia areata) is of two types: 1, the common variety of alopecia areata, and 2, the neurotic and endocrine forms of alopecia areata. The treatment recommended includes the use of humagsolan, a dialysate of a horny substance, internal remedies, such as arsenic and sulphur, and local treatment.

The monograph of Ehrmann is concerned with the relationship between eczematous diseases and internal diseases. Inasmuch as there is some confusion as to the exact definition of eczema, the author sharply defines the term. The relationship between eczema and the disturbances of metabolism, as it is encountered in diabetes, the uratic diathesis and in nephritis, is discussed. A certain type of eczema is seen to occur around the orifices of the digestive and urogenital tracts, as around the mouth and rectum. A description, the diagnosis, the etiology and the associated disturbances in the digestive tract and endocrine system, of neurodermitis are given. The general and local treatment of neurodermitis is given in detail.

MICROSCOPY OF THE LIVING EYE

Microscopie de L'Oeil Vivant. Par F. Ed. Koby. Paris: Masson et Cie., 1924. Pp. 240.

The introduction of the Gulstrand slit lamp (a modification of the Nernst lamp) marks a distinct achievement in the methods of eye illumination for examining purposes, and with the aid of the corneal microscope enables the examiner to obtain a most satisfactory view of the structure of the anterior portion of the eyeball. The illumination being very intense and concentrated, a high degree of magnification is obtainable, and minute study of the conjunctiva, cornea, iris, lens and vitreous is made possible.

This new field of microscopy of the living eye opens a wide vista of possibilities in the study of both the normal and the pathological eye, especially in the early recognition of certain conditions that escape the hitherto known methods of examination. It takes, however, a considerable degree of experience to manipulate the instrument, and still more to interpret the findings as they present themselves under this method of examination, and it is the purpose of this present work to assist the reader in acquiring this experience. With this in view the description of the apparatus, the technic of the examination, and the findings elucidated are gone into at considerable length and with painstaking details. While the work will stand no comparison with Vogt or Koeppe (in German) on the same subject, its conciseness and lucidity (we wish we could say the same of its few, too few, illustrations) recommend it as a serviceable guide book to the French reading ophthalmologist, who will, by the way, find in the author's bibliography of some eleven closely written pages everything of importance that has appeared in the literature of the last few years.

OVARIAN TUMORS

Würzburger Abhandlungen aus dem Gesamtgebiet der Medizin. Gegründet von Prof. Dr. Joh. Müller in Nürnberg und Prof. Dr. Otto Seifert in Würzburg. Neue Folge herausgegeben von Prof. Dr. E. Magnus-Alsleben in Würzburg. Zur Pathologie und Klinik der Ovarialtumoren. Von Dr. E. Stübler und Dr. Th. Brandess, Assistenärzte der Universitätsfrauenklinik in Tübingen. Neue Folge, Band I, Heft 9. Leipzig: Verlag von Curt Kabitzsch, 1924. Pp. 249-360.

Ovarian tumors, as well as other tumors, are neoplasms of an autonomical character. This definition excludes cysts. Tuboovarian cysts are therefore not included. Ovarian tumors are divided into epithelial, connective tissue, endothelial and mixed tumors. The lack of definite knowledge of the epithelial variety leaves the latter a still unsolved problem. Among the epithelial tumors, the ciliated epithelium cystomas and the pseudomucin cystomas must be differentiated.

Epithelial tumors may be divided into two groups: 1, mature forms, including simple serous cystoma, papillary serous cystadenoma, pseudomucinous cystadenoma and simple adenoma; 2, immature forms, which are again subdivided into, a, primary ovarian carcinoma, and b, metastatic ovarian carcinoma. The former includes adenomatous carcinoma, solid carcinoma, serous cystadenoma with malignant degeneration and pseudomucinous cystadenoma with malignant degeneration.

The connective tissue tumors of the ovary are also divided into 1, mature forms, such as fibroma and fibromyoma, and 2, the immature forms, including spindle cell sarcoma, round cell sarcoma, mixed sarcoma and endothelioma.

The mixed tumors include dermoid cystoma and struma of the ovary, malignant degeneration of dermoid cystoma and teratoblastoma.

The material collected for fifteen years includes 682 tumors in 670 patients. Ovarian tumors were found in 3.3 per cent. of 20,247 patients. The specimens were carefully studied microscopically and by several investigators to insure correct conclusions. The material was also worked up statistically in minute detail and a careful followup system was instituted. This monograph is probably the most complete work on the subject of ovarian tumors viewed from every angle.

CLINICAL DIAGNOSIS

Precis de Clinique Sémiologique; Diagnostics, Pronostics et Traitéments. By Gaston Lyon. Paris: Masson et Cie, 1924. Pp. 700.

It is an unfortunate, but nevertheless true, observation that more diagnoses are missed by the lack of application of available methods for revealing the presence of disease than by any abstract difficulty itself. Today, with our multifarious laboratory and physical methods for examination of the patient, there is much less excuse for errors in diagnosis than a decade ago, when many of the procedures which should now be in use by the practising physician were unheard of. In other words, mental and physical inertia is a large factor in incorrect diagnosis. The practical physician should spend much less time in reading about rare cases, which he is more than likely never to meet in his day's work, and far more time in studying the methods of diagnosis of the few simple conditions which will form ninety-nine per cent. of his practice, learning to recognize them in the various clinical manifestations under which one disease may masquerade as another. In such a profitable study, a short, clear, practical book on the methods of taking histories, of making physical examinations, and of evaluating laboratory reports should be the physician's constant companion.

There is an immense amount of useful information contained in this monograph.

RENAL DISEASE

Modern Methods in the Diagnosis and Treatment of Renal Disease. By Hugh Maclean, M.D., D.Sc. 2d Edition. Philadelphia: Lea & Febiger, 1924.

This small volume has been printed twice since it was first published in 1921. The appearance of a second edition is further evidence that it has accomplished its mission. The book aims to give a short, practical account of the important clinical methods employed in estimating renal function. There have been few changes in the new edition, for there has been little advance in these clinical methods in the last few years. It seems strange that the author, while laying great emphasis on the urea concentration test, makes no mention of the value of the observation of the specific gravity of the urine; and does not recommend the simple dilution and concentration test.

BIOCHEMISTRY

Handbuch der Biochemie des Menschen und der Tiere. Unter Mitwirkung von Geh. Rat E. Abderhalden, et al. Herausgegeben von Prof. Dr. Phil. et Med. Carl Oppenheimer, in Berlin. Zweite Auflage. Lieferung 11: Band I (S. 289-416) Bog. 19-26. Lieferung 12: Band I (S. 417-624), Bog. 27-39. Lieferung 13: Band VI (S. 289-410), Bog. 19-26. Jena: Verlag von Gustav Fischer, 1924.

The second edition of this manual is a monumental work on the biochemistry of man and animals. The long list of prominent collaborators, including the late Jacques Loeb, gives assurance that each topic is treated in a masterly way. Judging by the sample of the three numbers of this series submitted, it is a most comprehensive work. Both the theoretical and practical aspects of biochemical problems are discussed. Greater emphasis is naturally laid upon the application of biochemical study in man than in animals. Other investigators than Germans are also given due notice. The bibliography is very extensive and up to the minute, and each subject is treated exhaustively. Number 11 of the series deals with the pyrimidins and purins, nucleic acids, pigments with pyrrol nuclei and respiratory pigments. Number 12 includes the subjects of carbohydrates and the general chemistry and decomposition products of proteins. Number 13 of the series takes up the general biochemical basic principles of nutrition and the subject of vitamines. To one interested in the problems of physiological chemistry and biochemistry this work is indispensable.

LARYNGOLOGY

Lehmann's medizinische Handatlanten. Band XIV. Lehrbuch der Kehlkopfkrankheiten und Atlas der Laryngoskopie. Von. Dr. L. Grünwald, München. Dritte vermehrte und umgearbeitete Auflage. Mit 112 farbigen Abbildungen auf 47 Tafeln und 35 schwarzen Abbildungen im Text. München: J. F. Lehmann's Verlag, 1925. Pp. viii-312.

The third edition of this textbook on laryngology and laryngoscopic atlas is intended to serve as an aid to the beginner in the study of this subject in the art of observation and interpretation. The colored illustrations leave nothing to be desired as to beauty. Short histories of the cases cited and illustrated are given. The pathology and therapy are not neglected. Both the foreign and native (German) literature are included in the bibliography.

After discussing the anatomy and physiology of the larynx, the various methods of examining the larynx are given, including stroboscopy, stereolaryngoscopy, subglottic laryngoscopy, direct and indirect laryngoscopy, inspection, palpation, auscultation, röntgenography and electrical excitability, with practical suggestions. There is a chapter on the use and treatment of the voice.

The part dealing with pathology and therapy includes that of acute and chronic inflammations, neoplasms, disturbances in motility and sensibility, the affection of the larynx in diseases of the nervous system, combined motor and sensory functional disturbances, circulatory disturbances, hemorrhages, injuries, foreign bodies and malformations. The pathological plates are also beautifully illustrated and extremely instructive.

Too much cannot be said of the great value of this book to everyone interested in laryngology. It is intensely practical.

PERSONAL HYGIENE

The Foundation of Health: A Manual of Personal Hygiene for Students. By William Bernard Sharp, S.M., M.D., Ph.D., Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas. Bibliography, Illustrations, Diagrams. Philadelphia and New York: Lea & Febiger, 1924. Pp. 256.

The preface to this practical little book tells us that it is designed for use in early college years, and is based upon courses prepared for juniors at the University of Chicago and for students entering upon the study of medicine at the University of Texas. The text includes the middle ground between the strictly applied and the physiological methods of teaching hygiene.

POETRY

Flowers From My Garden. By Percy Hill. London: Arthur H. Stockwell, 1925.

This is a small book of verse written by a country dweller which has been inspired by the simple hardy flowers in his garden. The scene is laid in the country district of one of the most rural parts of England, the county of Norfolk, placed among fields with a babbling brook and a setting of trees and woods. The flowers are country flowers, such as flourish in such surroundings, and to each one a short poem is inscribed. The opening lines tell of the author's garden in April.

The idea of a book of poems devoted wholly to flowers is both pretty and novel. It may be said that the poetry, while metrically excellent, expresses in tuneful numbers the sentiments of the garden lover. Flowers lend themselves readily to poetical similes and Mr. Hill has successfully caught and held the spirit of his garden of flowers. Psychologically, in this ultrasophisticated and somewhat distraught age, placidly flowing verses may aid in soothing overstrung nerves and may act as an antidote to the sensational, erotic, and sometimes salacious writings which appear to find favor with a considerable proportion of the reading public.

Medicoliterary Notes.

The Nation's Health for January is a number of unusual interest. Among other articles it contains the following: Study of Drug Addicts in New York State Prisons, by Dr. Abraham Kossef, chief physician of the Clinton Prison, New York; What Is First Aid to the Injured? by Capt. G. R. G. Fisher, director of safety, accident prevention and first aid of the Illinois Manufacturing Association; A program of Education for Parenthood, by Thomas W. Galloway; The Leper Settlement at Palo Seco, by Frederick L. Hoffman; A Program in Sex Education for Boys, by Abraham W. Rosenthal, B.S., M.A., of New York City; and Mental Hygiene in Industry, by Thomas T. Read, safety service director of the U. S. Bureau of Mines.

* * *

Among late publications of Macmillan of interest are: *A Year of Prophesying,* by H. G. Wells, a criticism of the manners and customs of America as he saw them during his recent visit to this country; two plays: *Juno and the Paycock,* and *The Shadow of a Gunman,* both by the Irish dramatist, Sean O'Casey; and *Blind Man's Buff,* by Louis Hémon, author of Maria Chapdelaine. This is a story of sporting life in London, and so in the most different style possible from Maria Chapdelaine.

* * *

Now that the dome of St. Paul's of London has been declared unsafe, and the leaning towers of Pisa condemned, other public buildings are succumbing to the epidemic. The

last reported to date is the roof of Bath Abbey. A report from the Natural History Department of the British Museum states that specimens taken from the abbey roofs and submitted for examination are undoubtedly death watch beetles. The wood must be badly infested with these, and in many places is in a dangerous condition. Sir Charles Nicholson, the famous architect, has suggested that the ravages of the beetle may be checked and counteracted by turning on the roof timbers above the stone vaulting a powerful vacuum cleaner.

* * *

Announcement has been made of the winners of the hospital essay contest on the subject of The Interrelation of Hospital and Community, conducted jointly by *The Nation's Health* and *The Modern Hospital*. Dr. Edward A. Fitzpatrick, dean of the graduate school and educational director of Hospital College at Marquette University, was awarded the first place. The award carried with it a purse of $300. Lucius R. Wilson, superintendent of Barnes Hospital at St. Louis, was the second prize winner and received $150. Dr. D. R. Richardson, superintendent of the Providence City Hospital, of Providence, received the third prize of $100. Honorable mention was given to John R. Howard, Jr., superintendent of the New York Nursery and Children's Hospital; H. J. Southmayd, assistant superintendent of Mt. Sinai Hospital, Cleveland; and Miss Zella Nicholas, R.N., graduate of Mt. Sinai Hospital, New York. The judges in the contest were Michael M. Davis, Jr., Willard C. Rappelye, and Dr. Haven Emerson.

* * *

In commenting on the attitude of indifference manifested toward the child labor situation in Great Britain, an editorial writer in the *Manchester Guardian Weekly* says: "The true obstacle is that on the matter the national conscience is blunt to brutality. We are a nation of civilized cannibals, who differ from uncivilized cannibals only in that, while they devour their enemies, we devour our children; and incidentally, as the figures of unemployment show, make ourselves very sick in the process. This habit of passing successive generations of children through the fire in honour of whatever divinity takes pleasure in the ruin of boys and girls, has attained the dimensions of a public scandal." These are words that it would be well for some of the rest of us to ponder!

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The American Social Hygiene Association, with Dr. Haven Emerson as consultant, has made a study of the facilities provided for the prevention and treatment of gonorrhea and syphilis as a part of the preliminary inquiry necessary for the health demonstration program in Syracuse, N. Y.

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The calendar of courses for the spring term of the New School for Social Research includes religion and its philosophies, by Horace M. Kallen; racial groups in Greater New York, by A. A. Goldenweiser; problem children, by Bernard Glueck; crime and punishment, by A. A. Goldenweiser; problems in psychopathology, by Frankwood E. Williams; technic of influencing human behavior, by Harry A. Overstreet; dominant ideals of Western civilization, by Horace M. Kallen; psychological problems of social reconstruction, by Everett Dean Martin; formation of racial and national character, by William A. Thomas; primitive life, by A. A. Goldenweiser; and science and contemporary thought, by Morris R. Cohen.

* * *

It is reported by the Metropolitan Life Insurance that there is a well defined pneumonia region in the United States, namely New England and the Middle Atlantic States, together with two other seaboard states, Delaware and Maryland. The combination of humidity and low temperature is probably the cause. Pennsylvania shows the highest mortality rate from pneumonia, however, which is probably due to the occupational hazards of coal mining and the manufacture of iron and steel.

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One of the most recent of the Macmillan publications in London is *Prison Reform at Home and Abroad*, by Sir Evelyn Ruggles-Brise, president of the International Prison Commission. A summary is given of the work accomplished by all the Quinquennial International Prison Congresses held since 1872. The author emphasizes in this book, as in his former writings, the view point that penal reform should be concerned less with prison reform than with keeping offenders out of prison altogether.

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A carefully selected bibliography on pollution of waters has been prepared by the New York Public Library. The material included is divided into general industrial wastes, oil pollution, New York City and New York State's pollution, and the Passaic Valley sewer pollution. Copies of the bibliography may be bought from the Public Affairs Information Service.

* * *

Automobiles kill twenty thousand yearly in the United States. Nearly twenty times as many as they killed in the Battle of Culloden, which ended the hopes of the Stuarts to gain the throne of the British Empire.—*N. Y. World.*

* * *

Three million rats were killed in one week in London. The week ended November 15, 1924, and school boys, professional rat catchers and private citizens did the killing. One vermin chasing company is reported to have accounted for eight hundred thousand. The occasion was the inauguration of rat week. On its close London sanitary officials made a plea that the war on rats be continued until the body of London's last rat is given a place in the City Museum.—*Nation's Health.*

* * *

Recent publications of interest to medical science are *Now That I'm Fifty*, by Albert Payson Terhune (Doran); *The Physiology of Exercise*, by Dr. J. H. McCurdy (Lea & Febiger); *The Biological Foundations of Society*, by Arthur Dendy (Appleton); *Lighting in Relation to Public Health*, by Janet Howell Clark (Williams & Wilkins); *Immunity in Natural Infectious Diseases*, by F. d'Herelle (Williams & Wilkins); *The Child Health Library*, edited by John C. Gebhart (Hass); *The Education of Handicapped Children*, by J. E. Wallace Wallin (Houghton); *International Clinics*, v. 4 (Lippincott); *The Internal Secretions*, by Dr. Arthur Weil (Macmillan); *The Fruit of the Family Tree*, by Albert Edward Wiggam (Bobbs-Merrill); *Eyeless Sight*, by Jules Romain (Putnam); *Scientific Research and Human Welfare*, by Franklin Stewart Harris (Macmillan); *The Distribution of Physicians in the United States*, by Lewis Mayers and Leonard V. Harrison (General Education Board).

* * *

A meeting was recently held in London to advocate legislation against the abuse of all kinds of animals used for entertainment in theatres, circuses, rodeos, etc. A resolution was carried urging the government to afford facilities for the immediate passage into law of a bill providing for such legislation.

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The twenty-first annual report of the Bellevue and Allied Hospitals of the City of New York covering the year 1922 has recently been issued.

* * *

A bill is now pending in Denmark known as the Steincke bill, which proposes to allow a physician "to release a hopelessly ill person from severe and inevitable sufferings." Under the old law the taking of a patient's life at his special request came within the designation of manslaughter or murder.

* * *

Child labor seems to be assuming the dimensions of a world problem. In view of the recent activities in this country in regard to this social menace, it is of interest and significance to note that a campaign is under way in Great Britain to rectify the condition of the two and a half million young people between fourteen and eighteen employed full time in industry and save them from the serious physical, intellectual and moral deterioration that usually attends such a condition. In China women and children are being exploited under a horrible state of affairs. The latest report of the Child Labor Commission of the Municipal Council of Shanghai describes how children are "sold" into domestic service, and as "slave children are employed in native brothels and trained to prostitution." In the mills, children of six work twelve hours at a time, on day and night shifts, frequently standing the whole time. Many of them are brought from country districts by contractors and their conditions of life are practically those of slavery.

Abstracts from Current Literature

PEDIATRICS

Dislocation of Hip in Childhood.—C. C. Choyce (*British Journal of Surgery,* July, 1924) analyzes all recorded cases up to January, 1924, a total of fifty-nine, and as a result of his analysis advises guarded prognoses as to ultimate changes. For limping is apt to recur after a period of about a year, and pseudocoxalgia and similar changes may then be found.

Tumors of Mediastinum in Children.—L. W. Smith and J. S. Stone (*Annals of Surgery,* May, 1924) report two cases of mediastinal tumors in children. The difficulty of differential diagnosis is emphasized, requiring the use of modern laboratory methods. The only treatment of these tumors is surgical, if they present symptoms due to pressure. A review of the other mediastinal dermoid cysts and solid teratomata in children is presented and a discussion of their etiology is given.

Factors Concerned in the Etiology of Tetany in Children.—Grace H. Anderson and Stanley Graham (*Quarterly Journal of Medicine,* October, 1924) state that active tetany is always accompanied by a diminished calcium content of the serum, there being no relation, however, between ihe severity of the tetany and the decrease of the calcium. Latent tetany may or may not be accompanied by a low calcium content of the serum. The production of acidosis invariably leads to the disappearance of the signs of tetany, irrespective of a rise in the calcium content of the serum. The carbon dioxide combining power of the venous plasma is within normal limits in infantile tetany.

Effect of Diet on the Development and Extension of Caries in the Teeth of Children.—May Mellanby, C. Lee Pattison and J. W. Proud (*British Medical Journal,* August 30, 1924) demonstrated that when children are fed on a diet which has been shown in the case of puppies to result in the formation of well calcified teeth, then the initiation and spread of caries take place at a slower rate than in the case of similar children fed on diets not having such potent calcifying activity. The diet giving the best results is rich both in calcium and calcifying vitamines, and contains comparatively little cereal, none of which is in the form of oatmeal.

Pyelitis in Infancy and Childhood.—V. B. Dowler (*Canadian Medical Association Journal,* January, 1925) says that pyelitis is often a disease of infancy and childhood, that its presence is frequently overlooked, and urges that a microscopical examination of the urine should be made in every case of illness with fever during the early years of life. He thinks it a good plan to suspect pyelitis in any recurrent fever of obscure origin, for widely fluctuating fever with vomiting and diarrhea and negative physical findings are the commonest symptoms presented. He considers the use of potassium citrate in the treatment of the disease to afford an efficient means of ensuring a speedy and lasting recovery. A fatal termination of the disease is unusual.

Nephritis in Childhood.—Charles E. Sundell (*Clinical Journal,* October 29, 1924) says that the chief change in recent years in our views on the dietary control of nephritis is realizing that proteid is not as dangerous as was supposed, and that restriction of the salt intake is of greater importance in many cases. Especially is this true in the most common form of nephritis in children—the large white kidney. In such cases a diet rich in protein has been given with benefit on the assumption, borne out in practice, that it should help to make good protein wastage, promote diuresis and diminish edema. Diuretics are of little value in most cases, and in acute inflammation are directly harmful to the kidney cells. Some patients remain obstinately edematous for months in spite of the customary packs and purges. In these, small doses of pituitrin are occasionally of great help, but the question of decapsulation of the kidney may be considered; observers of repute have described numerous cases where this operation has had happy results. In any case of chronic nephritis in childhood where in spite of all our efforts kidney function cannot be restored, and the child is slowly but surely losing ground, decapsulation should certainly be advised.

Lymphoid Hyperplasia of Appendix in Children.—T. A. Smith (*Annals of Surgery,* June, 1924) points out the difference in symptomatology of lymphoid hyperplasia from acute inflammation of the appendix. It may be said that subacute or chronic appendicitis, usually of the recurrent type, occurs in approximately ten per cent of children with appendiceal symptoms. In the great majority of these cases the symptoms are due, not to an inflammation of the appendix, but to excessive hyperplasia of the lymphoid tissue in its walls, which symptoms are promptly and permanently relieved by removal of the appendix. Furthermore, as the majority of these cases conform to a recognizable syndrome, lymphoid hyperplasia should be considered as a clinical entity among diseases of the appendix.

Basal Metabolism in Childhood.—In the endocrine disturbances of childhood determination of basal metabolism is said by H. Janet (*Journal de médecine Française,* June, 1924) to furnish valuable indications. While hyperthyroidism is rare in childhood in the form of typical goitre, still, in the course of growth and particularly at the time of puberty, increased metabolism is often witnessed as a manifestation of mild thyroid dysfunction. In typical cases this can be reduced fifty per cent by administration of thyroid preparations. Delayed growth appears least capable of modification from the viewpoint of metabolic exchange. Although basal metabolism is lowered in cases of pituitary insufficiency as well, it is far less so here than in thyroid deficiency.

Treatment of Goitre in Infants.—F. Hamburger (*Münchener medizinische Wochenschrift,* December 26, 1924, reports two cases. The first was in a newborn child with a conspicuous goitre greatly interfering with respiration. For eight days one seventieth of a grain of sodium iodide was given daily. On the fourth day the gland began to diminish and by the eighth became normal in size; but diarrhea set in and the child died on the eleventh day, although the iodine had been stopped from the eighth. The author believes iodine administration to young infants should not be continued after the first sign of improvement is seen. The second case was in a child of eight months, whose breathing was also impeded by a goitre. One seven hundredth only of a grain of sodium iodide was given and repeated on the second and fourth day, each time accompanied by a minute dose of thyroidin. The gland diminished to normal size in a week.

Icterus Gravis of the Newborn.—The observations of Paul Klemperer (*American Journal of Diseases of Children,* August, 1924) lead to the conclusion that, in one group of fatal cases of jaundice in the newborn, the icterus is due to a destructive process of the liver; in another group, however, it has to be considered as a prolonged icterus neonatorum of anhepatocellular origin. These conclusions warrant certain suggestions to the pediatrist. The early differentiation in cases of jaundice between the serious type of hepatic jaundice and the milder form of icterus neonatorum is of importance. It can be accomplished by the examination of the blood serum for bilirubin with the Van der Bergh test. In cases of icterus of hepatic origin, a rational therapy should be tried to protect the liver against further destruction by sustaining its glycogen reserve. The beneficial results of glucose transfusion in mushroom poisoning and in toxemia of pregnancy, which aim toward the same point, suggest the same therapy in cases of severe jaundice in the newborn.

Large Thymus with Cyanosis in the Newborn.—E. T. Evans (*Surgery, Gynecology and Obstetrics,* October, 1924) believes that in newborn infants who exhibit cyanosis, whether constant or intermittent in attacks, in the absence of other definite cause, persistent large thymus should always be suspected. Such infants, even in extremis, should be given the benefit of x ray or radium therapy. Plates should be taken before and after treatment, to follow results. However, negative plates do not mean no thymus pressure, as it is anteroposterior thickness and weight of thymus, not width, which causes pressure unless the symptoms are due to an endocrine substance. Diagnosis of bronchopneumonia, obscure intracranial hemorrhage, and

congenital heart disease should not be made without more seriously considering persistent large thymus as a cause of symptoms. Because of recent work indicating persistence of the thymus gland as a relatively normal condition, cessation of symptoms following x ray treatment must be considered the more reliable criterion of diagnosis rather than the positive x ray picture. Some röntgenologists believe that a large thymus cannot be demonstrated, but autopsy findings have revealed them repeatedly, and certainly the abnormally wide mediastinal shadow diminishes in size under treatment coincident with the improvement in respiratory and circulatory distress. In some instances it is very difficult to demonstrate the enlargement, especially if it is in the anteroposterior direction. At any rate, if radiation produces appreciable benefit we feel that we are justified in treating all such doubtful cases.

The Lange Gold Chloride Reaction on the Cerebrospinal Fluid in Infants and Young Children.—C. G. Grulee (*American Journal of Diseases of Children,* August, 1924) reports that in congenital syphilis, the colloidal gold reaction in the spinal fluid may assume at times the same degree as that shown in cases of paretic dementia. Congenital syphilis varies rather frequently from the usual reaction, that is, a fluid which shows the greatest reaction in dilutions of 1:40 and 1:80. There is no regular agreement between the blood Wassermann and the Wassermann and colloidal gold reactions in the spinal fluid. There may be a strong reaction both to the Wassermann and to the colloidal gold solution in the spinal fluid with a negative blood Wassermann. Tuberculous meningitis more nearly conforms to the reaction with greatest intensity in dilutions of 1:160 and 1:320. It may, however, vary considerably from this in certain cases showing a progressive variation as the meningitis extends. Other conditions which may be easily confused with tuberculous meningitis, may show a colloidal gold reaction not dissimilar from that which is seen in certain cases of tuberculous meningitis. There is no definite reaction in most cases of idiocy and epilepsy.

Relationship of Rickets to Light.—A. B. Marfan (*Presse médicale,* January 24, 1925) does not believe it justifiable as yet to conclude that lack of sunshine, and particularly of the ultraviolet rays, is the principal or sole cause of rickets. If this were the case, it would be difficult to account for the fact that rickets is as common in the country as in the cities and in Italy as in Northern countries, and that it is unknown in Greenland, where night is practically continuous for four months in the year and where syphilis and artificial feeding are not observed. Lack of sunlight may, however, be put down as a predisposing cause of rickets. In France, it is not the main cause of rickets. The favorable effect of the ultraviolet rays in rickets is exerted first of all upon general nutrition. After a few exposures the appetite improves, sleep is more restful, the weight increases, and the red cells and hemoglobin show a notable rise. When rather old rickety children unable to walk are treated, they often begin to walk after about ten exposures. Aside from craniotabes, which shows rapid consolidation under these rays, their action on the bony deformities is not very apparent, though upon xray observation the mottled aspect of the end of the diaphysis is seen to lessen or disappear, and the wavy cuplike outline of the end of the diaphysis, which is characteristic of rickets, often undergoes a rather rapid change, becoming straight.

The Debilitated Child.—C. Wilfred Vining (*Lancet,* August 2, 1924) calls attention to the frequency with which the same type of sign and symptom is found in the histories and physical abnormalities in the debilitated child. These signs and symptoms are believed to be due to two main factors—nutritional and toxic, tonelessness being due to the former and many of the symptoms to the latter. The nutritional factor may be due to a long standing dietetic defect, together with the results of a chronic intestinal dyspepsia, while the toxic factor is believed to be due to absorption of toxins from the throat and bowel, especially the latter. The unhealthy throat may be secondary to the general tissue cell defect brought about by the nutritional factor.

In the relationship of tuberculosis, nerve disorder and rheumatism, the debility is in the large majority of cases not due to tubercle, although the possibility of strictly localized tuberculous infection in some group of glands cannot be altogether denied. It is believed that in these cases the infection is secondary to the preceding lowering of resistance and tone. The nervousness and nervous disorders of these children is secondary to the nutritional defect of the nerve cell and its irritation by toxins. The rheumatic infection of childhood appears in most cases to be ingrafted upon a preceding defect in health, which proves to be similar to the defects in health shown by the debilitated child, and it is suggested that the prophylaxis and control of the rheumatic diseases the child's health in its earliest years is of the first importance, and emphasis is laid upon the great importance of a well balanced diet and the avoidance of chronic intestinal dyspepsia.

Some Diseases of the Blood in Children.—J. P. Crozer Griffith (*Archives of Pediatrics,* August, 1924), as a result of some clinical studies, draws the following conclusions:

1. The blood picture of chlorosis is of frequent occurrence in infancy and childhood, and such cases should properly be designated chlorosis.
2. The administration of iron, without other treatment, is often of striking benefit in these cases and in simple anemia.
3. In disease of the blood in general, certainly in childhood, the symptoms appear to be almost, to a certain extent, interchangeable, or at least kaleidoscopic.
4. Without an examination of the blood a diagnosis is more likely to be mistaken than correct, and that even with it a diagnosis cannot be based upon any one hematological feature; certainly not on alteration in the character of the red cells; any excess either of lymphocytes or myelocytes, a high color index or a low color index.
5. There appears to exist no definite relationship between the degree of alteration of the blood and that of the size of the lymphatic glands and spleen.
6. Variations in the blood picture occur not only between different cases, making the differentiation of the disease present difficult, but from time to time in the same case.
7. In fact, only careful and often repeated examinations of the blood and of the symptoms in general insure our reaching a correct diagnosis.

Prognosis of Sequelæ of Epidemic Encephalitis in Children.—Roger L. J. Kennedy (*American Journal of Diseases of Children,* August, 1924) gives the following summary of a study of sixty-one cases of residual epidemic encephalitis in children under fourteen years of age, fifty-two of which were traced from the time of their first visit until the present:

Twenty-one patients, sixteen of whom were traced, presented the parkinsonian syndrome. None was improved; the condition of two was stationary, and of fourteen worse. One died from an intercurrent infection. The prognosis in this condition is not bad as regards life, but poor as regards improvement or recovery.

Twenty-three had changes in behavior and personality. Six were improved, and seventeen showed no improvement, or had become worse. The lack of restraint exhibited by these children does not necessarily imply any great degree of mental impairment.

Nineteen presented disturbances of sleep. Nine of these are now sleeping practically normally, three still show more or less disturbance, and seven are the same or worse.

The respiratory syndrome occurred in this series much more commonly than is indicated by the literature. Two of seventeen children who had this sequela are well; three are apparently improving, and the condition of twelve is unchanged. In none has the condition become worse.

Foreign Bodies in the Air and Food Passages of Infants and Children.—Russell S. Rowland (*American Journal of Diseases of Children,* August, 1924) states that the initial symptoms of foreign bodies in the air and food passages of infants and children are often not observed, and therefore no history is obtained, or the history may be obtained and not given sufficient consideration. Usually the higher the foreign body is lodged in the respiratory tract, the more pronounced the symptoms; while the lower down it is, the more marked the physical signs. Frequently in tracheal cases after the initial choking and strangling there is a symptomless period and then the tracheal symptoms develop. Esophageal foreign bodies of considerable size may produce no symptoms at first, but if allowed to remain in the esophagus for any length of time they may cause dangerous ulceration. The position of foreign bodies in the esophagus, as shown in the x ray plate, in relation to those in the trachea should be remembered.

Foreign bodies in the stomach rarely produce symptoms and no signs. With bronchial foreign bodies signs of a partial or complete obstruction of a bronchus are diagnostically of the most importance. It is a characteristic sign to have a multiplicity and changeability of symptoms. Sometimes organic bodies may produce sudden violent attacks, at other times the physical signs and x ray findings may not develop until several weeks after the accident. Small metallic bodies frequently cause no reaction at all, while large metallic objects may produce symptoms simulating tuberculosis, or some other chronic lung infection. Aspiration of nursery powders may be extremely dangerous. Certain objects cannot be demonstrated by the x ray, while others make no shadow on the plate, and still may give a diagnostic picture and definite signs and symptoms. Endoscopy should be resorted to in suspicious cases not demonstrable by x ray. An early diagnosis may be of vital importance.

A fuller appreciation of these facts and of the importance of the history, signs and symptoms will help us to recognize more promptly some of the unusual foreign body cases; it will assist us to differentiate the acute conditions from pneumonia and the chronic cases from tuberculosis and empyema. It will remind us that the etiological factor in bronchiectasis and gangrene of the lung may be a foreign body, and that a persistent wheeze is not always the result of anaphylactic or thymic asthma, but may sometimes be due to a foreign body.

GASTROENTEROLOGY

Invagination of the Jejunum in Gastroenterostomy.—H. Vulliet (*Schweizerische medizinische Wochenschrift,* July 24, 1924) reports that the invagination of the jejunum in gastroenterostomy may occur after the classical operation, that a fresh gastric ulcer need not be present, and also that the vomiting following the operation plays no important part in the occurrence of this complication.

Biliary Infections.—D. P. D. Wilkie (*British Medical Journal,* August 2, 1924) finds that failure to detect and remove a stone from the common duct is the usual cause of recurrent symptoms after operation, and, where doubt exists, incision and exploration of the duct should invariably be practised. The condition of the pancreas, appendix, the stomach, and duodenum must be investigated, as coincident lesions in these organs are by no means rare and may require to be dealt with, in order that complete recovery may follow. Only with good anesthesia and a free incision can the complete pathological picture be displayed and adequate treatment be safely employed. Inadequate operation can only bring disappointment to the patient and discredit to surgery. The removal of several hundred gallstones will avail nothing if the stone which was the real cause of the trouble be left behind. To remove one or more calculi and leave an infected, thickened, and functionless gallbladder may give the patient some relief but will not result in a cure, and is evidence of a failure on the part of the surgeon to appreciate the intrinsic mural character of the gallbladder infection. Timely preoperative diagnosis and complete assessment of pathological change at operation are the two essentials for the successful treatment of biliary infections.

Relationships of Diseases of the Gallbladder to the Secretory Functions of the Stomach and Pancreas.—H. Ernest Griffiths (*Lancet,* August 2, 1924) calls attention to the close developmental origin and nervous association of the gallbladder, pancreas, pylorus and first and second portions of the duodenum, resulting in closely allied physiological actions and pathological reactions. The best clinical example of this relationship is pylorospasm. Irritation of the mucosa of the gallbladder results in a reflex irritability of the vagus, shown especially by an increase in the amount and acidity of the gastric juice in the stomach, associated with relaxation of the pylorus and regurgitation from the duodenum. Hyperchlorhydria was found associated with regurgitation in ninety per cent. of the cases of cholecystitis with or without gallstones. The duration of the inflammation and its degree are commensurate with the intensity of the secretory deficit in the stomach. True hyperchlorhydria occurring in inflammatory lesions of the gallbladder appears to be due to intercurrent disease, although it occurs regularly in advanced cases of carcinoma of the gallbladder.

Acute pancreatitis is generally a sequel of pancreatic lymphangitis. Here there is already congestion of the pancreas, and a tendency to vomit. Spasm of Oddi's sphincter is accompanied by regurgitation of bile into the pancreatic duct. Vomiting or straining increases the pressure of the bile, resulting in hemorrhage from the congested bile capillaries and liberation of the ferment trypsin, the activity of which is increased by the presence of bile. The regurgitation of bile is not a prerequisite of hemorrhage, as it may be due to congestion alone. Infection in the gallbladder is always associated with gastric disorders and subsequent pancreatic disturbances.

Relation of Medical to Surgical Treatment of Gastric and Duodenal Ulcers.—Frank H. Lahey and Sara M. Jordan (*Boston Medical and Surgical Journal,* September 25, 1924) present as their conclusions:

1. It is desirable to exhaust the possibilities of adequate medical measures for gastric and duodenal ulcers before submitting them to surgery.
2. Medical measures in gastric and duodenal ulcers, in addition to their ability to relieve, aid in confirming or disproving the diagnosis and, furthermore, are of real value in certain cases in demonstrating the need for surgery.
3. Preliminary medical management with rest in bed makes operation safer and easier in many cases later to be submitted to surgery.
4. Gastroenterostomy even with its possibility of failure to cure and of subsequent gastrojejunal or jejunal ulcer is still the most useful of all the gastric operations. The fact that when its employment as a curative measure in gastric or duodenal ulcer fails, it still represents an already accomplished part of the radical operation makes it then only a complete failure when gastrojejunal or jejunal ulcer follows its employment.
5. Radical resections should be reserved for those cases where the indications justify the risk of its employment as a primary measure.

Surgical Treatment of Gallbladder Disease in Diabetics.—Daniel Fiske Jones, Leland S. McKittrick, and Dwight L. Sisco (*Boston Medical and Surgical Journal,* October 16, 1924) say that operation for gallstones is especially indicated in the diabetic, but many patients are not operated on owing to the teaching that the dangers of operation are too great. They believe that the diabetic patient can be operated upon for gallstones with practically no more danger than the nondiabetic patient, provided all conditions are propitious. The evidence supports the statement that preventive surgery in diabetics is not only justifiable but rational. Gallstones should be removed as soon as a positive diagnosis can be made, and acute cholecystitis should be treated the same as infections of any kind in diabetics, that is, as an emergency.

Chronic Appendicitis.—F. N. G. Starr (*Northwest Medicine,* September, 1924) classes these cases for purposes of treatment into four groups.

1. The cecum may be mobile without much atony but it produces a drag on the superior mesenteric vessels and thus crowds the duodenojejunal junction. One must bear in mind that, when the cecum is mobile and becomes atonic, it reverts to that of prehistoric man or to the type of the herbivorous animal. Therefore, meat must be eliminated from the diet. In order to change the bowel flora as quickly as possible from the flora of the carnivorous to that of the herbivorous animal, a yeast cake may be eaten night and morning. Flaxseed added to the diet ensures a daily bowel evacuation. Abdominal massage and physical drill helps, and when in the upright position these patients should wear a corset with an abdominal "lift." When one has not easy access to a good corsetmaker, an ordinary abdominal belt with an oblong rubber bath sponge under it serves the purpose admirably. Under such circumstances the alteration from semiinvalidism to rude health is sometimes very striking. This method of treatment, I should say, is applicable to well over four fifths of the patients seen.
2. Failing to get physical efficiency in this way, in the early mild cases where the cecum is still an abdominal organ, probably all that is required to bring about a cure is the removal of the appendix, the sharp division of the ileal link, combined with plication of the cecum, after dividing by sharp dissection a constricting fibrous band at the junction of the cecum and ascending colon over the outer leaf of the mesentery, as well as a sigmoid band fixing the sigmoid to the left broad ligament in the female, or the pelvic wall in the male.
3. When the cecum is a pelvic organ, resembling the herbivorous type, and is in a similar stage of atony with

marked ileocecal regurgitation, the removal of the appendix with plication of the cecum and then a burying of the plicated margin into a slit three or four inches long in the posterior parietal peritoneum, leads to a cure. There was no mortality in the first hundred cases. There have been two deaths apparently from pulmonary embolus in the second hundred. Afterward the patients gained in weight from ten to thirty pounds, with increased efficiency and a loss of much of the neurasthenia. In fact, some practitioners have complained that such treatment of their patients has destroyed a weekly source of revenue.

4. In the advanced cases, where there is marked atony with third degree incompetency of the valve, and long continued ill health, where the appendix has been removed and a subsequent series of adhesion breaking, health breaking, and heart breaking operations have already been done, nothing short of a radical resection of the terminal ileum, cecum, and ascending colon, with an end to end anastomosis.

Clinical Aspects of Unsuspected Hypertoxic Appendicitis.—E. St. Jacques (*Canadian Medical Association Journal,* September, 1924) in summing up his remarks, says that acute appendicitis is sometimes hypertoxic and is then rapidly gangrenous. The toxicity induces acute infectious enteritis almost immediately from the onset. The diarrhea appears as the dominant characteristic of these cases. Pain is present, at the onset localized at McBurney's region, but is rapidly generalized throughout the whole of the abdomen on account of the acute enteritis. The degree of pain is moderate at McBurney's point at the onset, usually escaping the attention of the patient on account of its spreading rapidly to the whole abdomen, by reason of the enteritis. Muscular defense or rigidity is scarcely present at the onset, but becomes well marked when diffuse peritonitis sets in. The pulse is usually rapid from the start, a condition due to the infectious character of the disease. The temperature may be only moderate, sometimes subnormal. The general condition of the patient is decidedly bad from the onset. As Comby and Dieulafoy have well pointed out in their clinical lectures, this particular variety of acute hypertoxic appendicitis is not infrequently met with in children, but may also be seen in adults; its course is rapidly fatal if operation is not performed early. The etiological factors are the presence and abnormal activity of bacteria, the coli bacilli not infrequently, a variety of streptococcus frequently, and in the rapidly hypertoxic variety, anaerobic bacilli, Welch's or some other. Lastly, the clinical fact must ever be borne in mind that in children, so prone to pneumococcus peritonitis, which is usually primary without a former acute pneumococcus infection, this type of appendicular peritonitis is in the vast majority of cases accompanied at the very onset by diarrhea with persistent offensive stools. Acute appendicitis imposes surgical intervention and the quicker the better.

Traumatized Bile Ducts.—J. F. Erdmann (*American Journal of Surgery,* May, 1924) discusses the anatomy of the cystic duct, and the effects of trauma upon it. He gives an illustrated series of cases with the following operative technic which he used and recommends for all complicated or long standing traumas. The proximal end being found, the tube or catheter is introduced one to two inches into the liver and sewed in with one or two chromicized catgut sutures, grasping the tissues of the duct and the capsule of Glisson in the needle bite. The protruding catheter or tube is cut off so that six to eight inches remain exposed. The duodenum, in the instances when the distal duct is not found, is then attached below the hepatic duct fully one quarter of an inch to the peritoneum covering the liver (capsule of Glisson) with two to four sutures closely placed. A flap is cut, in character like that in a gastroenterostomy. An opening is made through the muscular and mucous coats large enough to admit the tube which, by means of its six to eight inches of length, is passed around into the transverse portion of the duodenum, so that the tube has no kink at its entrance into the liver and gut. The musculomucous posterior area is sewed to the edge of the hepatic opening, and the anterior to the upper edge of the hepatic opening. Finally the peritoneum of the duodenum is sewed to the liver above the tube. The well is wiped dry, a rubber tissue drain is placed in, and the abdominal wall is sutured. The subsequent care includes early removal of the drain.

Following the operation there is a rapid loss of jaundice, a marked rapid mental change and a pronounced gain in weight. The recurrences must be ascribed to contracture of the newly formed canal following the passing of the tube before proper epithelization takes place. Therefore all attempts at fixation of the tube should be made, contrary to the early feeling that some material should be attached to the distal end of the tube to promote its removal by peristalsis. The great difficulty is that peristalsis will pull and push the tube without any accessory. That the tube may become plugged and obstruct the flow of bile must be considered and this requires removal with or without reintroduction of another.

Relationship Between the Islets of Langerhans and the Zymogenous Tissue of the Pancreas.—Swale Vincent (*Lancet,* May 10, 1924) finds that the islets of Langerhans are not separate and distinct organs. They represent temporarily modified portions of the secretory tubules of the pancreas. The differentiation observed in the cells as a result of some forms of staining may point to different stages of activity and not indicate two distinct types of cell. Moreover, these are signs of a similar differentiation among the cells of the zymogenous tissue. The islets are anatomically continuous with the zymogenous tubes, and the two kinds of tissue may be seen to merge one into the other. During inanition and under other circumstances the amount of islet tissue is regularly and markedly increased.

Spirochetosis Icterohemorrhagica.—G. Lovell Gulland and George Buchanan (*British Medical Journal,* February 23, 1924) conclude from their clinical observations that the leptospiral organisms found in man and rats produce lesions typical of infectious jaundice when inoculated into guineapigs. The result of the inoculations is fatal in seven to fourteen days. Subinoculation into the same species, with either human or rat strains from dead infected guineapigs, is more rapidly fatal in both cases, the period being five to six days. The two organisms isolated from one case (man and wild rats) were morphologically identical. The organism has been cultivated. Its characteristics in dark ground illumination consist of very minute regular spirals throughout its entire length, and a hook at one or both ends. The hooked end rotates in the manner of a propeller, and progress occurs in the direction of the unhooked end. If both ends rotate it remains practically in the one place. The pathogenic action, morphology, and behavior in culture of the leptospira up to the present time show it to be identical with the Japanese, European and American strain described and compared by Noguchi.

Gallstone Treated by Cholecystostomy.—E. MacD. Stanton (*International Journal of Medicine and Surgery,* September, 1924) presents a study of the end results of a hundred gallstone cases, which are in brief as follows:

1. The first requisite of successful gallbladder surgery is a correct diagnosis. The end results following operations for true gallstones are highly satisfactory. In the absence of gallstones the end results are certainly no better and possibly no worse than diagnoses on which they are based.

2. In gallstone cases cholecystostomy can be depended upon to give excellent results provided that all of the stones are removed from the gallbladder and ducts and that the cystic duct is left in a condition to remain patent.

3. All of the evidence presented by this group of cases indicates that the tendency of the gallbladder to overcome infection and to repair the damages produced thereby is similar to that of all other hollow viscera, and that in the absence of persisting obstruction the subsidence of the infection and a return to a condition of satisfactory functional repair can be confidently expected.

4. The twenty-six cases of acute empyema of the gallbladder studied by the writer, in which all of the stones were removed at the primary operation and which were treated by cholecystostomy, yielded end results fully up to the standard of other groups. This would indicate that the surgeon confronted with an acute inflammatory condition of the gallbladder need have little hesitancy in leaving it if he fears that its removal would necessitate a more dangerous operation than a simple cholecystostomy.

5. In the presence of choledochotomy for common duct stones cholecystostomy has, in the writer's experience, given highly satisfactory end results. In cases in which common duct obstructions have recurred or subsequently developed, the presence of the gallbladder made secondary cholecystenterostomy a safe and satisfactory operation.

6. The available data would tend to indicate that following cholecystostomy for gallstones, recurrence of stones in the gallbladder or ducts can be expected to occur at a rate of something less than one per cent. a year.

Use of Eserine and Strychnine in Postoperative Abdominal Distention.—Karl H. Martzloff (*Bulletin of the Johns Hopkins Hospital,* November, 1924) presents the results of a study of 162 cases subjected to major abdominal operation under ether anesthesia, in which eserine salicylate, grain 1/1000, and strychnine sulphate, grains 1/40, were given hypodermically to each alternate patient immediately on her return to the ward after operation, and every four hours thereafter for eight doses. Of the 162 patients, seventy-four received the drugs, and eighty-eight did not. The following facts appear from an analysis of these cases: Of the patients receiving the drugs, thirty-four developed distention totalling 776 hours, and eleven of the untreated patients developed distention totalling 147 hours. Emesis occurred as a complication in the treated cases in twenty-seven patients, and in the untreated group in twenty-six patients. Voluntary micturition was reestablished in twenty-four hours after operation in forty-four of the treated patients, and in sixty-one of the untreated patients. In studying the relation between postoperative distention, emesis and delayed voluntary micturition, no definite difference was found between the treated and untreated groups. The conclusion is reached that no benefits have been demonstrated from the postoperative use of eserine and strychnine as described, in abdominal operations on the pelvic viscera.

Surgical Treatment of Hepatic Cirrhoses.—W. J. Mayo (*Annals of Surgery,* September, 1924) discusses the various types of cirrhosis and methods of treatment. He believes that in the present incomplete state of our knowledge, cirrhoses of the liver may be divided into two fairly definite groups: 1, portal cirrhosis, the result of deposits of connective tissue around the radicles of the portal vein, causing ascites and hemorrhages from the stomach, and 2, biliary cirrhosis, the result of deposits of connective tissue around the biliary duct system, causing chronic jaundice.

The portal cirrhoses may be of two distinct types clinically; a primary gastrointestinal type, sometimes definitely the result of alcohol, pepper, or other irritating substances taken with food, in which the spleen is not greatly enlarged. In suitable cases, splenectomy and the Talma-Morison operation combined may have value. Splenectomy in addition to the Talma-Morison operation carries an increased risk, however, and before splenectomy is performed, the functional capacity of the liver should be tested. In the secondary splenic type of portal cirrhosis, occurring in the last stages of splenic anemia, splenectomy gives splendid results.

The common forms of biliary cirrhosis are the results of obstructions and infections of the biliary ducts, usually associated with gallstone disease, and removal of these infections and obstructions, in cases not too far advanced, can be expected to result in cure. The spleen is not greatly enlarged in such cases, and splenectomy appears unnecessary. There is a splenic type of biliary cirrhosis, however, chronic in character, in which the splenomegalia is a prominent symptom and splenectomy may be indicated.

Diverticulitis of the Colon.—E. S. Judd and L. W. Pollock (*Annals of Surgery,* September, 1924) present the following conclusions to their study of a number of cases. Diverticulitis of the colon is more common than was formerly believed. There may be a solitary diverticulum in any portion of the colon, or a great many diverticula distributed from the ileocecal valve to the rectum. It is apparently not progressive, and may remain unchanged for years. In many instances it apparently does not cause symptoms. Diverticulitis is a disease of middle life. The condition we speak of as diverticulitis is peculiar to the sigmoid. We have not observed the condition, which is a diffuse edema, inflammation, and swelling throughout all of the tissues of the colon and mesentery, in any other quadrant of the colon. As the inflammation in the diverticula and wall of the colon progresses, an abscess may form and later perforate into the abdominal wall, bladder, or intestine. If the inflammation remains chronic, a tumor composed of fibrous tissue and the products of inflammation develops. It is often difficult to distinguish between diverticulitis of the sigmoid and carcinoma; in a number of the cases the conditions are associated. Just what influence diverticulitis has on the development of carcinoma, we are unable to determine. If the history reveals that the patient has had repeated similar attacks, and has noticed a tumor for a long time, increasing and receding from time to time, the probability is that it is due to a diverticulitis. In some instances, a definite diagnosis cannot be made until the tissues have been examined histologically. Many patients with diverticulitis can be relieved by dietary and medical management. If an abscess forms from the perforation of a diverticulum, or extension of the infection through the wall of the colon, drainage is indicated. If perforation occurs into other regions, an operation is the only procedure that offers relief. If there is any question as to the nature of the tumor, operation is indicated. The mortality from radical operations for diverticulitis has been very high. The difficulty in these cases has arisen from stirring up the infection that existed in the tissues around the colon before the operation. It seems to us from a review of the results in these cases, that the plan of procedure should be a preliminary colostomy for the purpose of caring for any obstruction in the colon, and particularly the reduction of the inflammation in the diverticula by frequent irrigations of the lower colon. Resection of the infected portion can then be made with less risk.

BLOOD AND LYMPH GLANDS

Value of Blood Transfusion in Acute and Chronic Anemias.—Odön Khoór (*Zentralblatt für Gynäkologie* August 2, 1924) summarizes his experiences with blood transfusion after acute and chronic hemorrhages as follows: The functional capacity of the transfused blood was not demonstrated; at any rate, the blood elements disappear, especially the erythrocytes, within twenty-four to forty-eight hours. The transfused blood produces unpleasant, sometimes very severe chills and high fever lasting for days; the transfusion has an inherent danger of hemoglobinuria, aside from that due to thrombosis and air embolism. In addition, the author found neither a mentionable nor a lasting improvement in the blood picture in his comparative studies either after acute or chronic hemorrhages. The transfusion cannot take the place of the lost blood. Its only effect is a stimulation of the erythropoietic system and it simply acts as an homologous serum for the body in place of the physiological sodium chlorid solution used heretofore. Consequently, the author believes that the use of blood transfusion is indicated only in the most selected cases and after careful study. An absolute necessity for it was never encountered.

Chlorides of Serum, Blood, and Corpuscles in Various Pathological Conditions.—H. C. Gram (*Journal of Biological Chemistry,* September, 1924) presents a study of the chloride concentration in serum, cells, and whole blood in cases with low serum chloride and anemias and polycythemias. In the cases with serum chloride higher than normal, the relative corpuscle NaCl in several cases varied markedly in both directions from the relative serum chloride, while the relative blood chloride agrees with the latter to within three per cent. Whether or not the variation in chloride concentration of the serum—which is independent of cell volume—is taken into account, there is no evidence that the chloride concentration in the corpuscles rises and falls with the cell volume percentage.

A Case of Polycythemia Vera with Special Reference to the Familial Features and Treatment with Phenylhydrazine.—Trevor Owen (*Bulletin of the Johns Hopkins Hospital,* August(1924) reports in detail a case of polycythemia vera in which the symptoms were neurological, and the disease was discovered in another member of the patient's family. The patient received phenylhydrazine hydrochloride, 0.1 gm., in a capsule by mouth every day from January 7th to March 1st. There was no gastric disturbance, and since the blood count did not diminish rapidly, and there were no unpleasant symptoms after six days, he was given an extra 0.1 gm. every other day. He received a second course from April 9th to June 17th. The plan for further treatment is to have the blood counted regularly every two weeks for some time, and to give 0.1 gm. doses frequently enough to maintain the blood at a constant level.

Retinal Hemorrhages in Bothriocephalus Anemia.—Martin Cohen (*Archives of Ophthalmology,* July, 1924) calls attention to the fact that in severe anemias which simulate pernicious anemia the bothriocephalus latus may be the causative agent. According to accounts in the literature more than half of these cases show significant retinal hemorrhages, which are numerous, located mainly around the papilla and may be preretinal, circular, and striated. Such hemorrhages are not pathognomonic of bothriocephalus anemia, but are suggestive when associated with secondary anemia of unknown origin.

Transfusion in Osteomyelitis.—M. L. Janes (*American Journal of Surgery,* May, 1924) offers the following conclusions to his study of three cases. Blood transfusion is an essential measure in combating infection, overcoming anemia and emaciation and stimulating the recuperative powers of a patient. The procedure is indispensable in all cases of protracted suppuration involving bone. It should be performed as promptly as possible to ward off degenerative changes in the vital organs of the body resulting from prolonged suppuration.

Blood Coagulation.—E. C. Mason (*Surgery, Gynecology and Obstetrics,* October, 1924) studies the production and prevention of experimental thrombosis and pulmonary embolism, with the following results. Three components, fibrinogen, calcium and tissue extract, enter into the formation of the intravascular, as well as the extravascular clot. Of all agents promoting intravascular coagulation, none is so potent as tissue extract. Purified heparphosphatid has been titrated against the most active tissue extract and found to neutralize the coagulant action of such extract. If clinical thrombosis and embolism are comparable with experimental thrombosis and embolism, the anticoagulant offering so effective protection in one should be of use in the other. The anticoagulant should find a clinical use as an anticoagulant in blood transfusions and also as an anticoagulant in the determination of the blood hematocrit, or wherever the hypertonic action of excess salt is contraindicated.

Lymphatic Leucemia: Age, Incidence, Duration, and Benefit Derived from Irradiation.—George R. Minot and Raphael Isaacs (*Boston Medical and Surgical Journal, July* 3, 1924) present data concerning ninety-eight cases of chronic lymphatic leucemia and fifty-seven of the acute form. End results were studied in eighty cases of the chronic form in patients over thirty years of age, fifty of whom treated by intensive irradiation by radium or x rays, and thirty not so treated. Most cases of the chronic form occur in persons from forty-five to fifty-five years of age. Acute lymphatic leucemia seldom occurs after twenty-five. Both forms affect males about three times as often as females. Both are relatively more frequent in females in the earlier than in the subsequent years of life. The correct diagnosis in the chronic cases was not established on the average until one and four tenths years after the first symptoms.

Irradiation had no detectable effect on prolonging the duration of either form of the disease. The average duration of life, after the first symptom, in eighty chronic cases in which the patients were over thirty years of age, was three and forty-five hundredths years, being essentially the same for the fifty irradiated cases and the thirty that were not.

The chronic disease lasts a shorter time in younger than older persons. About sixty per cent. of the patients in chronic cases live one to four years, and fourteen per cent. six to eight years. In about fifty per cent. of the acute cases the patients died in less than two months after the initial symptoms appeared.

There was a great similarity in the time the different patients first received irradiation as related to the total duration of their disease, indicating that if the disease was destined to be of long duration the patients had insidious symptoms for a longer time than those fated to a short course. The early institution of irradiation as yet does not promise a more favorable prognosis with respect to life extension. Irradiation, properly administered, undoubtedly benefits symptomatically cases of the chronic form though not as much as in chronic myelogenous leucemia.

Moderate or greater general improvement after the first course of irradiation, occurred in forty-seven per cent. of sixty-one cases; rather slight improvement in thirty per cent., and no improvement in twenty-three per cent. The efficiency of ten per cent. was increased strikingly. The chances of improvement are in fairly direct relationship with the time before death that treatment is given.

The beneficial effects of irradiation in acute lymphatic leucemia are but evanescent and slight. Irradiation may induce a better production of the three formed elements of the marrow and lessen the activity of the formation of lymphocytic cells. The hemoglobin level, numbers of blood platelets, and character of the lymphocytes serve more importantly to adjudge the patient's condition than the number of white cells. An aleucemic blood picture may occur when patients are seriously ill.

Irradiation usually causes little or no improvement in the patient when the hemoglobin is fifty per cent. or less, or when outstanding purpura with thrombopenia is present, or when there are many immature and atypical lymphocytes in the peripheral blood.

The effect of irradiation on decreasing the size of lymph nodes or spleen in chronic lymphatic leucemia is apt to be proportional to the amount of improvement in the patient's general sense of well being. Definite exceptions occur but distinct pressure symptoms due to enlarged external or internal lymph nodes were rarely not alleviated.

Treatment should be guided and prognosis formulated from correlated information obtained from the patient's history and physical signs, together with complete blood examinations and basal metabolic rate determinations. By so doing, in spite of irradiation becoming less and less effective and the patient's comfort decreasing as the disease progresses, this therapy is of distinct value and maintains the patient's efficiency usually much better than if no irradiation is given.

Blood Transfusion.—L. B. West (*American Journal of Surgery,* September, 1924) cites the Mount Sinai Hospital records for transfusion of blood during the year 1922. There both the citrate and the stopcock method were used. Chills followed transfusion by the whole blood, or stopcock, method, in thirty-four per cent. of the cases, while in twenty-three per cent. chills followed citrate transfusions. From a review of the literature and from personal experience with various methods the author finds that the citrate method of blood transfusion is the method of choice, especially in surgical conditions requiring transfusion.

Experimental High Intestinal Obstruction in the Monkey.—Russell L. Haden and Thomas G. Orr (*Journal of Expermental Medicine,* January, 1925) present a chemical study of the blood of the Macacus syrichtus species of monkey after the intestine has been experimentally obstructed. The changes observed are variable, but quite similar to those previously reported in man and the dog. All animals showed a marked rise in nonprotein nitrogen and two showed a marked drop in the chlorides, with a less marked fall in the others. There was a rise in the carbon dioxide combining power. No changes were recorded in the uric acid and creatinine. There was no vomiting which affords additional evidence in favor of the authors' theory that the fall in the blood chlorides is concerned in some way with the toxemia.

Cholesterol in the Blood in Cases of Gallstones.—J. M. H. Campbell (*Quarterly Journal of Medicine,* October, 1924) examined the blood of fifty-two persons, in twenty-two of whom disease of the gallbladder was diagnosed. The conclusion is reached that the amount of cholesterol in the blood in cases of gallstones and cholecystitis is within normal limits, provided the subject is not jaundiced. The determination is therefore of no help in the diagnosis of gallstones. This investigation lends no support to the theory that the formation of gallstones is caused by a raised cholesterol content of the blood and bile. It does not exclude the possibility, for it may be that in all the cases examined the active pathological change was over and the gallstone was left as a legacy. The normal findings in some cases of cholecystitis make this unlikely.

Sodium Content of the Blood of the Dog After Experimental Intestinal Obstruction.—Russell L. Haden and Thomas G. Orr (*Journal of Experimental Medicine,* January, 1925) report sodium determinations on the blood of ten dogs after experimental obstruction of the jejunum. Very little change in the sodium content was noted, the total sodium tending to rise rather than fall.

Distribution of Chlorides in the Blood of the Dog After Experimental Intestinal Obstruction.—Russell L. Haden and Thomas G. Orr (*Journal of Experimental Medicine,* January, 1925) undertook this investigation to determine the distribution of chloride in the blood of the dog after experimental obstruction of the jejunum. The chlorides were estimated simultaneously in whole blood, in plasma, and in the cells. The fall in blood chlorides in intestinal obstruction was found to involve both the cells and plasma, and almost equally so. Determinations on whole blood are more desirable than on the plasma. The close agreement in chloride by the iodimetric titration and the Van Slyke digestion method shows definitely that the chloride does not exist in the blood in some undetermined form.

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Medicolegal Notes.

ADMISSION OF "WRONG OPERATION" HELD NOT SUFFICIENT TO MAKE SURGEON LIABLE

In an action for malpractice growing out of the employment of defendants by plaintiff to perform a surgical operation on him for the cure or removal of a hernia in the region of the right groin, it was held, Markart v. Zeimer, (Cal. App.) 227 Pac. 683, that where no evidence was offered tending in any substantial way to show that defendants in performing their surgical operation closed the inguinal canal so tightly that it interfered with the action of nerves or stopped the flow of blood to plaintiff's right testicle, or that when the wound commenced healing "the inner walls adhered and grew fast to the bowels of" the plaintiff, it was error, in instructing the jury, to submit these issues to the jury. And where the complaint charged the defendants with a trespass in removing the testicle without plaintiff's consent and against his expressed direction, but no charge was made that the work of removing it was carelessly or unskillfully done, it was held error to submit the question of the degree of skill and care exercised by defendants in the operation.

It was also held error to charge that a physician is liable for the want of "proper" skill and care of his assistant, if any. All that is required of him is that he have the degree of skill ordinarily possessed by reputable physicians practising in his locality.

It was held that an admission by one of the defendants that the operation was a "wrong operation" and a "misoperation" amounted to more than an admission that the operation was not properly done, and that was not sufficient to render him liable. "An admission," the court said: "to be sufficient must be an admission of negligence or lack of the skill ordinarily required for the performance of the work undertaken. This 'wrong operation' may have been deemed right at the time it was performed. If it was so mistakenly performed as the result of a bona fide judgment by a qualified surgeon, he will not be held liable for the unfortunate results of his mistake."

BRIGHT'S DISEASE AS AN EFFECT OF AN ACCIDENT

In a workmen's compensation proceeding the physician who attended the applicant immediately after his injury testified to an injury to the applicant's kidneys which he attributed to the effects of the accident; and the Industrial Accident Commission's medical director, in his report upon the case, and referring to the fact that three hours after the accident the symptom of hematuria was observed in the patient, declared that that circumstance was good presumptive evidence that damage to the kidney occurred. The evidence also showed that kidney or Bright's disease is not usually painful, and it was held that where it is accompanied by pain of sufficient severity or frequent occurrence as to interfere with the applicant's ability to pursue his calling it becomes a factor in estimating the amount of the award.

ACCELERATION OF DISEASE BY STRAIN

Where the weight of the evidence showed that an applicant was injured in the handling of a car coupler; that as a result of that injury or the aggravation of his condition adhesions in the left inguinal region, by the strain in handling the coupler, he died within five days of his injury—that is to say, that the accidental injury contributed to his death, an award of compensation was affirmed. "Where a workman dies from a pre-existing disease or condition, if the disease or condition is aggravated or accelerated under circumstances which can be said to be accidental his death results from injury by accident. Acceleration or aggravation of a pre-existing disease is an injury caused by accident." Chicago & Alton R. Co. v. Industrial Commission, 310 Ill. 602, 142 N. E. 182.

EFFECT OF PROOF OF PRE-EXISTSNG HERNIA

The Georgia Court of Appeals holds, London Guarantee & Accident Co. v. Shockley, 122 S. E. 99, that while "in all claims for compensation for hernia resulting from injury by accident arising out of and in the course of the employee's employment, it must be definitely proved to the satisfaction of the Industrial Commission that the hernia did not exist prior to the accident for which compensation is claimed." Ga. Laws 1920, p. 170, 2, subd. (c); yet, where a claim is for a complete strangulated hernia, mere proof that prior to the accident from which the complete hernia arose, the claimant showed a possible sign of a partial hernia, but not attended by pain or reduced capacity for work, does not even authorize, much less demand, a finding that the hernia alleged to have resulted from the accident in question had previously existed.

EXPERT EVIDENCE AS TO HOW DECEASED RECEIVED INJURIES ADMISSIBLE IN MURDER CASES

In a wife murder case the theory of the state was that the fatal wounds were inflicted by repeated blows of a blunt instrument. The theory of the defendant was that they were caused by an accidental fall on stone steps. The body was found in the night time at the foot of the stone steps at the kitchen door of the defendant's home. She had suffered a slight contusion of her nose, a larger contusion on her left arm, two scalp wounds on the side of her head, a compound comminuted fracture of the skull at the back of the head, and the tissues below the place where the skull was crushed were reduced to pulp. The state introduced no witnesses who saw the wounds inflicted, and the defendant claimed that when they were inflicted he was in bed and asleep.

As against objections to expert opinions as to how the deceased received her injuries, the Kansas Supreme Court held, State v. Elftman, 226 Pac. 795, that the opinions of doctors who examined the wounds and the stone steps were admissible. The court said: "The data for the jury's inference lay in a field of knowledge scientific in character, most thoroughly apprehended by specialists. The trained professional mind has peculiar qualifications for observation and interpretation of such data. It was not possible to make experts of the jurors in the course of the ten day trial, and the only effective method of giving them the benefit of professional knowledge, training and skill, was to bring to their consideration conclusions in the form of opinions of those who were competent to express them. The true criterion for determining whether or not opinion evidence is admissible is correctly stated by Dean Wigmore to be: 'On this subject can a jury from this person receive appreciable help?" Wigmore on Evidence (2d Ed.), sec. 1923.

Further authority for admission of doctors' opinions in this case was found by the court in Kennedy v. People, 39 N. Y. 245, 256, where the question was as to the amount of force requisite to break deceased's skull; Clemons v. State, 48 Fla. 9, 37 South. 647, where the question was whether the fatal blow was struck with metallic knucks or some similar weapon, or with the naked fist; and Davis v. State, 38 Med. 15, where the question was whether fatal wounds were received by falling into a bin of a mill, or were inflicted by blows of a blunt instrument.

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Intracranial Hemorrhage in the Newborn From the Obstetrician's Viewpoint*

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During 1924 there were 15,160 babies born in the Bronx. Of this number 629, or 4.1 per cent., were stillborn and 469, or 3.1 per cent., died during the first month of life, making a total of 1,098 potential lives lost during one year.

I therefore feel that the obstetrician should take a greater interest than he has in studying the cause of these deaths, so as to lower their frequency and by the recognition of early symptoms institute proper treatment.

Intracranial lesions play an important part in the production of this mortality. Accurate information concerning the incidence of these lesions, especially of tentorial lacerations, became available only after the adoption of Beneke's special technic of post-mortem examination of the skull. Older statistics are unreliable.

Reports of autopsies on infants stillborn and dying within a few days of birth up to 1919, revealed in 2,305 cases reported by various observers, 163 or seven per cent. having intracranial lesions, whereas 1,102 cases reported since 1919 by several clinics showed an incidence of twenty-nine per cent. of intracranial lesions. In the more recent statistics the percentage runs up to forty and fifty per cent. of all autopsies.

Intracranial lesions as a result of birth trauma are therefore common and are being discovered in ever increasing frequency, because they are being more carefully sought for. In a considerable percentage of autopsies, intracranial lesions, especially tentorial tears with slight or no hemorrhage, represent only accidental findings, proving that many infants survive, even though they have received definite intracephalic injury during birth.

In 1907 Seitz published his paper on brain hemorrhages in the newborn. This served to renew interest in this important subject, but it was not until 1910 that Beneke described the pathology and frequency of tentorial laceration. He described a method of opening the skull in the sagittal suture and carefully pulling the parietal bones down on either side. Rough manipulation results in injury to the underlying dura and indeed might cause a tear in the tentorium. Both hemispheres of the brain are then ablated and the tentorium laid free for inspection.

Most authorities agree that intracranial hemorrhages of clinical importance in the newborn are most often situated just above or just below the tentorium. The tentorium consists of an upper and a lower blade. The upper is the one more commonly torn, usually at its free edge.

There are three types of tentorial lacerations described: 1. A severe form in which the tear is through the free edge, often bilateral and through both blades of the tentorium. The edges are ragged, fringed and covered with thick coagula. Blood spreads upward and forward into the temporal fossa, often rising laterally over the occipital lobe. Occasionally the blood spreads downwards over the cerebellum passing into the spinal canal. 2. A milder form in which there is laceration of upper blade only and the hemorrhage is less severe. 3. A mild form which is most common, showing a small hematoma at the end of the falx or between the blades of the tentorium. This type is clinically often overlooked, as it may give rise to no symptoms and seldom results in death of the infant.

ETIOLOGY

Hugo Ehrenfest in America and Eardley Holland in England, maintain that trauma is the cause of intracranial hemorrhage in almost every case. Ehrenfest classifies the cause of this condition into: a, immediate causes; b, predisposing and contributory causes. Immediate causes are chiefly mechanical in nature. This origin is obvious in those cases of depression or fracture of the skull, either directly due to pressure from forceps blades, or to forcible traction along protruding portions of the rigid pelvic canal, such as the promontory, symphysis or exostoses. In cases where there is no evident obstruction to the passage of the fetal head, the mechanical cause is less apparent. Even though the fetal head is a fragile object, it displays remarkable qualities which enable it to resist injuries at the same time that it presents certain defects which dispose it to suffer them. The wonder is not at the relatively small number that suffer intracranial injuries but at the

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large number that reach the world alive and uninjured.

During its passage the head is subjected to compression and therefore is in a state of stress. Cranial stress can be regarded as consisting of two elements. A general compression of the whole head and a simple longitudinal compression by opposite forces acting at the ends of the long diameter of engagement of the head in the pelvis. The outstanding feature of the fetal head is its ability to undergo changes in shape, or moulding, when subjected to stress. A certain amount of cranial stress occurs in every case, and in every labor there is a certain amount of moulding. When there is excessive cranial stress a dangerous degree of alteration in shape occurs. Bending of the cranial bones is resisted by the septa —i. e., the falx and the tentorium, and if the alteration in shape is too great, the septa tear. This tearing permits still greater alteration in shape and dangerous disturbance of intracranial contents occur.

Because of the belief that only evident mechanical factors caused intracranial injuries, it has generally been accepted that these injuries occurred only in difficult and instrumental deliveries. This view must be changed because it has been shown that serious intracranial injuries may occur in apparently normal spontaneous labors, especially if predisposing and contributory causes are present. These factors are asphyxia, prematurity and hemorrhagic disease of the newborn. Because of the general use of pituitrin, it must be emphasized that intracranial injuries may be caused by a quick compression of the fetal head of so short a duration, that even immediately after birth there will be no characteristics of prolonged compression, such as persistent overlapping of the cranial bones or a large caput. It should be remembered that intracranial injury may result from the forced passage of the fetal head through an undilated cervix and rigid vulvar ring.

A quick compression of the fetal head also occurs in multiparæ in whom the fetal head is not firmly engaged during the first stage of labor. These infants are frequently born in one or two pains as soon as cervical dilatation is complete. This rapid expulsion causes momentary compression and may cause severe intracranial injury.

The after coming head in breech delivery is frequently delivered rapidly and therefore is notoriously susceptible to intracranial injury. The strong pressure of the symphysis against the suboccipital region is the cause of tentorial laceration. It has been reported that in stillborn breech extracted infants, there were tentorial lacerations in seventy-five per cent., and it has been estimated that the aftercoming head is sixteen times more liable to suffer intracranial injury than in vertex presentation. In the newer method of breech extraction advocated by Potter this frequency is greatly lessened.

PREDISPOSING CAUSES

Prematurity.—In all series of cases of intracranial hemorrhage there is a high percentage of prematurity. This is ascribed to the fact that the bloodvessels and dura of the premature infant are very fragile due to their incomplete development. The premature infant is extremely vulnerable to the traumatisms of birth and in a large proportion of the fatal cases, labor is normal and spontaneous. Here again it must be emphasized that in spite of the fact that prematurity means a small baby and therefore less general compression, yet compression of the head may be rapid and of short duration, as might be caused by rigid soft parts in the birth canal.

Asphyxiation.—Asphyxiation was formerly regarded as an important cause of intracranial hemorrhage. This view has greatly changed since autopsies performed after Beneke's method have established the great frequency of tentorial laceration. This has led to a proper appreciation of the mechanical factors as a cause of intracranial injuries, many of which are not associated with hemorrhage. It is now believed that in many of the seemingly asphyxiated newborn infants, the asphyxia is the result rather than the cause of the intracranial lesion, and that efforts to overcome the asphyxia often exaggerate the effects of the intracranial lesion.

Most older statistics of the causes of infant mortality, within the first few days of life, fail to mention intracranial trauma. These deaths which are now known to be considerable, are included in those due to various obstetrical operations, but many, especially those subsequent to spontaneous labors, are classed as asphyxiation. Statistics regarding asphyxiation in the newborn are therefore misleading.

The etiological relationship of asphyxiation to intracranial lesions is limited to the belief that a congested vein is more likely than an empty one to rupture under pressure or strain. Asphyxia can only be regarded as a predisposing cause and occasionally as a contributory factor in so far as congestion may result in the extravasation of a larger amount of blood from an injured vein.

When a newborn infant is deeply asphyxiated, intracranial injury should be strongly suspected.

CONTRIBUTORY CAUSES

Hemorrhagic disease of the newborn.—In autopsies of cases of intracranial hemorrhage, it is occasionally noted that there are smaller and larger hemorrhages in the mucosæ and serosæ of the body. These were formerly considered as evidence of the asphyxia, which was believed responsible for the intracranial lesion. Most likely all the hemorrhages in such cases are due to a common cause, the hemorrhagic disease of the newborn. Of course intracranial trauma in the presence of hemorrhagic diseases of the newborn will result in a greater outpouring of blood from the injured vessel and result fatally sooner.

Manipulation during resuscitation.—In the Schultze method of resuscitation of the asphyxiated infant, the shoulders are grasped on either side and the head is fixed between the wrists. In the swinging there is frequently considerable lateral compression of the head. Such compression may cause tentorial laceration and since such an infant is asphyxiated and its vessels engorged, even a small tentorial injury may cause considerable extravasation of blood. In such cases the infant seems normal soon after resuscitation, but gradually presents signs of intracranial hemorrhage. All vigorous manipulations during resuscitation where the baby is swung or held head downward, will make a severe intracranial lesion of one that might have been mild or given no signs of its existence.

PROPHYLAXIS

It has been proved conclusively that in the presence of certain predisposing factors, especially of prematurity, the trauma of spontaneous normal labor may be sufficient to injure the intracranial structures, and that asphyxiation, brusque manipulation and hemorrhagic disease tend to exaggerate the effect even of minor lesions. Although this has lessened, it has not eliminated the responsibility of the obstetrician for such injuries. Certain obstetrical procedures undeniably prove disastrous to the infant. Disregard of certain details in the proper execution of obstetrical operations renders these procedures needlessly dangerous.

FORCEPS

The danger of high forceps is well known and every obstetrician of experience tries to evade this operation. The immediate mortality of this procedure has been calculated as between forty-three and fifty per cent. In forceps delivery with the fetal head firmly engaged or in midpelvis, statistical reports from large maternity services show a mortality varying from seven to twenty-seven per cent. These results are reported from obstetrical clinics, where the majority of the operations are in expert hands and are performed generally only for well defined indications. A reduction in the number of these injuries, which in part are unavoidable, can only be achieved by a limitation of the number of forceps applications.

Forceps must be applied for definite indications. When the operation is undertaken in the interest of the mother, the possible injury to the baby should be taken into account more seriously than is the prevailing custom. This applies to the obvious readiness of many to apply forceps because of assumed exhaustion of the patient, which usually is rather the impatience of the parturient woman or the weariness of the attendant.

When undertaken in the interest of the child, it must be remembered that prolonged compression of the head is less harmful to the infant than a difficult extraction. It is here that ironing out of the pelvic floor and episiotomy are useful to eliminate the possible danger of sudden and severe compression of the head by an unprepared and rigid vulvar ring. There is no doubt that the general practitioner underrates the difficulty of determining the necessity for a forceps extraction and of performing it properly with the least possible risk to the child. In many instances serious injury can be ascribed to defects in technic as follows: Too early application of the forceps, before the cervix has been eliminated as a barrier to extraction; the exact state of rotation of the head is not recognized, and the forceps are applied in the transverse diameter of the pelvis, but not as they should be, as closely as possible corresponding to the transverse diameters of the fetal head; during the process of extraction the direction of traction is not changed so as to correspond exactly to the sequence of flexion, rotation and extension required by the normal mechanism, as the head passes from one pelvic plane to the next. Failure to adhere to these requirements implies excessive and dangerous compression of the head in one or another direction.

The forceps should never be employed to overcome difficulties arising from a marked disproportion between the head and the pelvis. Traction should be made slowly with interruptions sufficient to permit the head to mould gradually. If the head is larger than normal, or the forceps blades cannot be employed along the shorter transverse diameter, the forceps handles necessarily will not be in close apposition. They must be steadied in their relative positions to avoid their compression during extraction.

AFTERCOMING HEAD

It is estimated that in breech labors under the management of the general practitioner, the mortality of the infant averages fifteen per cent. The clinical diagnosis of the cause of death is usually given as asphyxia, presumably due to compression of the cord between the pelvic wall and the aftercoming head. Postmortem studies have shown the actual causes of death to be spinal and intracranial injury, especially tentorial laceration in the majority of cases.

Correction of the malpresentation by external version before labor has started, is a measure of distinct value in prevention of birth injuries.

During the delivery it is important to eliminate both the cervix and the vulvar ring as a barrier to extraction of the head. This is accomplished normally by allowing the breech to progress spontaneously until the umbilicus reaches the vulva before the extraction of the infant is undertaken. This end is accomplished by the ironing out process of Potter. Slow and deliberate extraction of the head through a vagina and a vulva dilated after this method, occasionally aided by an episiotomy, will lessen the danger of intracranial injury without increasing the risk of asphyxiation. The application of forceps to the aftercoming head is a procedure that often facilitates the extraction of a head that might require undue traction and pressure from above to effect delivery.

PREMATURE LABOR

The high mortality of premature infants may be due to the trauma of birth rather than is customarily assumed, the immaturity of the newborn. Autopsies on all newborn infants bear evidence for the frequency of severe injuries after normal and quick labors in premature babies. The induction of premature labor as a method of dealing with minor pelvic contractions, is now rather generally discouraged because of the great loss of children in this procedure.

The vulnerability of the immature child renders it necessary also in spontaneous labors to avoid any severe or abrupt compression of the skull. Even a small dose of pituitrin, if it quickly forces the head through an incompletely dilated cervix or rigid vulvar ring may prove disastrous to an immature infant.

RESUSCITATION

Brusque manipulation must be avoided during the resuscitation of the asphyxiated newborn. Schultze's method of swinging should not be employed. Simpler procedures such as mouth to mouth insufflation, skin stimulation, hot and cold bath, intermittent traction on tongue, careful compression

of the thorax and insufflation of a few drops of aromatic spirits of ammonia, will prove sufficient if the asphyxia is not due to intracranial injury. This possibility must be kept in mind in cases of deep asphyxiation. Vigorous manipulations in such cases are prone to exaggerate the condition.

CONCLUSIONS

1. Intracranial lesions, mild and severe, develop in the course of both normal and abnormal labors.

2. Evidence of such injuries can be discovered at autopsy in approximately one half of all infants stillborn or dying within the first few days of life. But only in half of these cases is this injury the cause of death. In the other half such traumatic lesions, chiefly tentorial lacerations without or with slight hemorrhage, represent but incidental findings.

3. In a large number of cases today, intracranial parturitional injuries are overlooked.

4. Obstetrical routine should include a careful examination of the newborn and observation of his behavior during the first few days of life. Such a routine tends to reduce the number of unrecognized intracranial lesions and affords an opportunity for prompt therapeutic intervention.

5. Having learned to recognize these cases, we will make greater efforts to prevent their occurrence.

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The Correct Conception of Thoracic Empyema and Its Rational Physiological Treatment

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New York

(*Concluded from page* 465)

SPECIAL TECHNICAL POINTS. LINE OF INCISION AND DRAINAGE

Perfect drainage is most essential in treating empyema and the lowest point reached by the pleura might seem to be the most logical point to be selected for the incision. The pleura lines organs that form an angle (the costodiaphragmatic) as shown in Figs. 9, 10 and 11. Incision made in the lowest portion would have to go through thick muscular and fatty tissues and would actually not drain the pus. In fact, after pus has been present in the pleural cavity for some time the two leaves of the pleura lining the costodiaphragmatic angle become adherent and the space between the two leaves is occluded either by adhesions or fibrin deposited between them and there is danger of entering the peritoneal cavity. (Fig. 9.) Moreover, even if pus should escape freely when the incision is made, there would be danger that the diaphragm might later block the opening made in the pleura, after the bulk of the pus is evacuated, because the diaphragm which is low when the pleural cavity is full of pus raises up immediately after the pus is evacuated and obviously would block the very low opening made in the pleura, and cause a new collection of pus in the pleural cavity.

Incision must be made where the tissues above the pleura are thin, the intercostal space is wide, pus can be obtained freely, there is no danger of entering the peritoneal cavity. The incision recommended answers all these desiderata.

Incision close to the lower rib.—The incision must be made close to the upper edge of the lower rib in order to avoid lesion of the bloodvessels situated just below the lower edge of the upper rib. (Fig. 9.) Remember that hemorrhage from the intercostal vessels is very difficult to control and might be fatal, because the bloodvessels can bleed freely into the pleural cavity.

Incision of the pleura during inspiration.—Fig. 10 shows that the diaphragm is lowered during inspiration, so that in order to avoid injuring it, the incision of the pleura should be made when the diaphragm is lower, that is during inspiration.

Adhesions should not be broken.—Certain authors have recommended the breaking of all adhesions. Nothing is more dangerous than breaking the adhesions found in the pleural cavity. Breaking of adhesions opens numerous channels through which infection can be diffused. It will often cause a pulmonary fistula by tearing also some lung substance adherent to the adhesions. It makes complete restitutio ad integrum impossible, because in breaking the adhesions the epithelial lining is violently torn and must be replaced by connective tissue. Breaking of adhesions, therefore, is dangerous to life and prevents rapid and complete recovery. By using our cannula all adhesions break spontaneously and are reabsorbed, because the vacuum created in the pleural cavity actually forces the pus to break through any pocket in which it might have collected and compels the expanding lung to take its place. It is easily understood (Fig. 11) that even, when the pus is sacculated and our cannula is applied to the pleural cavity in a dependent position, the emptying of the lower pocket creating a vacuum and compelling the lung to expand, causes the breaking down of the adhesions that separate the different pockets and drains out all the pus contained in the pleural cavity. We had a striking illustration of this in a case in which clinically the pus appeared to be abundant and after opening the pleural cavity only a comparatively small quantity of pus was obtained. In the afternoon the patient had a sudden strange sensation in his chest and dyspnea: pus filled rapidly a six ounce bottle connected with the cannula and overflowed. As an x ray examination of the patient had not been made, we can only surmise that we had to deal with a case of sacculated empyema, as represented in Fig. 11, a large pocket of pus breaking a few hours after the pleural cavity had been

opened. The recovery was complete and very rapid, twelve days.

ACTION OF AUTHOR'S CANNULA

The physiopathologicomechanical problems that present themselves in treating empyema are ideally solved by our cannula. Practical experience has demonstrated that our cannula will positively drain all the pus that is found in the pleural cavity, whether the pus is thin or thick, free or closed up in small or large pockets; compel the lung to expand gradually and progressively; not cause any shock, deformity or any other immediate or late complication; reduce trauma to a negligible minimum; allow the patient a maximum of comfort and confidence during and after the operation; shorten the time of treatment; make possible operation even in moribund cases with great possibilities of saving life, and make possible and easy the cure of double empyema.

FIG. 14.—Patient twenty-four years of age. Streptococcus empyema following influenza. Patient was in very poor general condition, but notwithstanding these handicaps was cured in less than three weeks. See Figs. 15 and 16. Picture shows right pleural cavity filled, with great amount of fluid and heart shadow displaced to the left.

Simultaneous drainage and expansion of lung.—The drainage of the pus and expansion of the lung take place simultaneously after the application of the our cannula. Drainage does positively and continuously take place for the following reasons: pus or membranes are easily passed through the channel formed by the cannula, which is much larger than the opening obtained even after extensive rib resection when rubber tubing or other drainage material is used. In fact, the cannula is made of extremely thin metal which occupies little space; its channel cannot be obstructed or narrowed at any point or under any circumstances, because obviously it cannot be compressed and its oval shape allows the exit of large membranes. The large size of the channel established by the cannula between the pleural cavity and the outside, although enormously wide, favors lung expansion, because it is provided with a positive valve which allows the exit of the pus but does not allow air to enter the pleural cavity, realizing airtight closure and drainage of the pleural cavity at the same time.

This is perhaps the most striking and valuable feature of the cannula. Indeed, it is seen (Fig. 12, A, B) that the valve can close the cannula completely, making it airtight, so that, when the patient inhales, the atmospheric pressure will push the valve against the edges of the opening of the cannula and completely prevent the entrance of air into the pleural cavity; while, when the patient exhales, the valve is raised up and part of the pus and any air contained in the pleural cavity will escape outside. Thus really effective automatic elimination of all the pus with progressive gradual expansion of the lung, and the rapid and positive cures obtained, even in cases of double empyema, can be understood. On opening the pleura some pus escapes through the incised tissues and air enters the pleural cavity, so that the pleural cavity is filled by pus, air and the retracted lung.

We rapidly apply the cannula. What happens? The opened pleural cavity becomes again a closed cavity to the effects of intrathoracic pressure, because no air can enter it, so that the organs of the mediastinum, the other lung and the diaphragm begin immediately to functionate again as before the establishment of the empyema, that is in a perfectly physiological manner, notwithstanding the fact that the pleural cavity of the affected side of the thorax is still pathological, because it contains pus, air and the corresponding lung is retracted. The condition just described and created by the application of the cannula is an important factor in the rapid complete recovery of the patient, because it is evident that the more normal, that is, the more nearly physiological are the conditions of the organs just mentioned and the function of which is most intimately associated and affected by the function of the diseased side of the thorax, the more rapid and sure will be the complete reestablishment of the physiological conditions of the entire thorax, which means complete recovery of the patient.

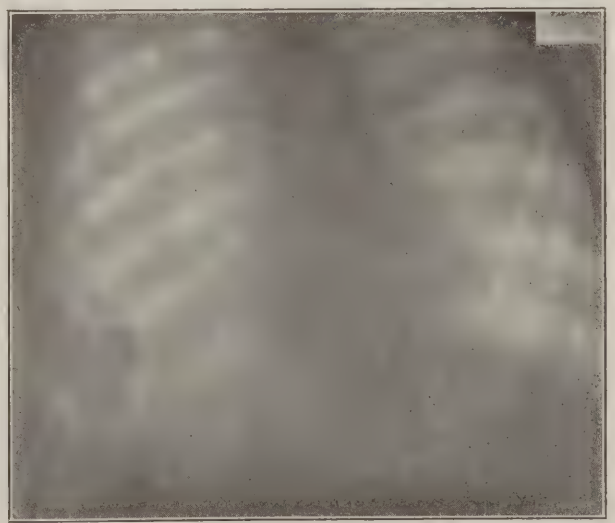

FIG. 15.—Same patient six days after operation. Right pleural cavity filled somewhat in lower third suggesting thickening of pleura and slight amount of fluid.

The application of the cannula has therefore created the following condition: the whole thorax is a closed cavity to the effect of intrathoracic pressure, pus and air are present in the affected side of the

thorax, fill the pleural cavity, compress the lung and to a certain extent the organs of the mediastinum, the other lung, the diaphragm. The patient breathes, and, even supposing that the lung of the affected side be adherent to the parietal pleura and not easily distended, at each respiration some pus and some air will, and actually do, escape through the cannula,

Fig. 16.—Same patient nine days later. X ray report (Dr. Van Winkle) right lung filled is practically clear throughout. On this day the cannula was removed and patient discharged six days later.

because the healthy lung expands, and in so doing dislodges the contents of the neighboring pleural cavity, that is, the pus first and then the air contained in it, which escape through the cannula. Consequently at each respiration we can see a certain amount of pus come through the cannula.

That the pus at the beginning is expelled by the action of the healthy lung and the diaphragm seems to us logical, because in many cases the affected lung has been compressed for such a long time that it seems illogical to think that it will begin to expand again after the application of the cannula, while the pleural cavity is still full and under the pressure caused by the pus and the air, and the fact that there is always some displacement of the healthy organs of the other side of the thorax and of the diaphragm. These organs which can expand freely will do so: as soon as the action of the valve of the cannula allows. Also the fact that pus does not come out in a continuous stream, but in small quantities at each expiration, proves our contention. We stated that pus is expelled first and then the air. This is a fact of great importance. We also stated that one of the most important elements in the physiological treatment of empyema is the early gradual progressive expansion of the lung, and we think that no one can challenge this statement. No other apparatus or instrument or method of treating empyema allows or favors, and, we could say, almost compels such an automatic, gradual progressive expansion of the lung. Indeed, when we open the pleural cavity, we allow air to enter it; after we have applied the cannula no more air can enter the pleural cavity, so that the affected lung, the organs of the mediastinum, the other lung, and the diaphragm are compressed, immediately after the application of the cannula, by the pus still present in the diseased pleural cavity and by the air that entered it during the operation.

We have seen that the diaphragm, the healthy lung, the mediastinum, tend to reassume their normal positions and functions and in so doing dislodge the pus which escapes through the cannula during expiration. When all these organs have reassumed their normal positions and functions, the diseased pleural cavity still contains pus and air. The continuous respiratory movements will alternatively compress and relax the diseased pleural cavity, so that at each compression pus and air will escape through the cannula, which, however, will not allow any air or pus to reenter the pleural cavity, because the valve completely closes the cannula. We have, therefore, the following condition: a thorax which is closed during inspiration, and opens during each expiration, allowing a certain amount of pus and air to be expelled through the cannula, so that in the diseased pleura a certain amount of vacuum takes place. As *natura abhorrit a vacuo,* the vacuum so created must be filled by some organs. At first the depressed diaphragm, the dislodged mediastinum and the healthy lung reassume their normal position, later they might even be dislodged towards the affected side of the thorax. In doing so, however, there will be a kind of drawing on the contracted lung, which will also be forced to expand in order to fill the vacuum created by the expelled pus and air contained in the pleural cavity, until the lung is com-

Fig. 17.—Boy, eight years of age. Pneumococcus empyema. Right pleural cavity filled, heart displaced to left. The pleural cavity was filled with thick pus and membranes. Cannula was removed by mistake by house surgeon only six days after operation.

pletely expanded and has filled again the pleural cavity. It is easily understood how the lung is gently forced to expand, and pus will be evacuated, no matter how thick or whether it is incisted in large or small pockets. The air that has entered the pleural cavity during the operation acts as a cushion on

which the affected lung can rest; is lighter than the pus and so the pus will be eliminated first, through the cannula put in a low section of the thorax; but air is elastic so that the vacuum created at each respiration after the greater amount of pus has been expelled, will not expel a great quantity of air, but a quantity that will be proportionate to the amount of expansion that the lung is able to obtain. The expansion of the lung is consequently regulated automatically by the lung itself, according to its possibilities, and not forced as it would be if some one from outside would try to create a vacuum, which procedure would be extremely dangerous.

It is clear now why we are pleased that air enters the pleural cavity during the operation, and why we do not try to evacuate any pus at the time of the operation, but allow the pus to come out spontaneously after the application of the valve. The explanation given above makes it easy to understand why patients do not collapse but feel greatly relieved immediately after the application of the cannula. Some patients feel so well they even ask to walk back to their room. The explanations given above show also why we deprecate so strongly the breaking of any adhesions, even if they should have divided the pleural cavity in various compartments as shown in Fig. 11, forming a sacculated empyema. Indeed, even if the pus was closed up by strong adhesions, the vacuum created by the continuous repeated expirations would break these adhesions because the pus would be compressed on all sides by the expanding lungs, and diaphragm. No adhesions could withstand the continuous bulging caused by the vacuum created by the respiratory movements, which are repeated without interruption about twenty or more times each minute, day and night. If *gutta cavat lapidem,* certainly the continuous bulging of the membrane closing up pus will break and allow the pus to escape and favor early cure.

CRITICAL REVIEW OF OTHER METHODS OF TREATMENT

The preceding considerations make lengthy criticism unnecessary. The methods that keep open the pleural cavity prevent expansion of the lung, whether they attempt to sterilize the pleural cavity or simply drain it. The methods resorting to aspiration of pus without opening the pleural cavity, leave pus in the pleural cavity and do not actually compel the lung to expand as it would appear to do. Indeed, the only manner in which the lung could be forced to expand with the pleural cavity closed, would be to actually remove all the pus and create a vacuum, which would be filled by the lung. It is only necessary to mention that if a vacuum was created the inflamed pleura would bleed profusely, to demonstrate that such a vacuum with consequent lung expansion is not actually created. The methods which try to create a valve with living tissues fail to do so; at the best they only obtain an imperfect and temporary valvular action. That all the methods fail in some respect is proved by the fact that the earliest cure is obtained after six to seven weeks in the most favorable cases, the average being from two to three months, when chronic empyema or other complications do not set in to delay the cure indefinitely or cause death.

The amount of pus and the length of time during which pus is drained from the pleural cavity, constitute the most convincing criticism, when patients treated by the method described are compared with patients treated by any other method. In patients treated by our method, the amount of pus decreases so rapidly that a few hours after the application of the cannula only a few drops are drained. When any other method is applied, the amount of pus is enormous days and weeks after. How can we explain this difference? There is only one possible explanation: the means used to treat the pleural cavity do actually cause pus production, thus delaying

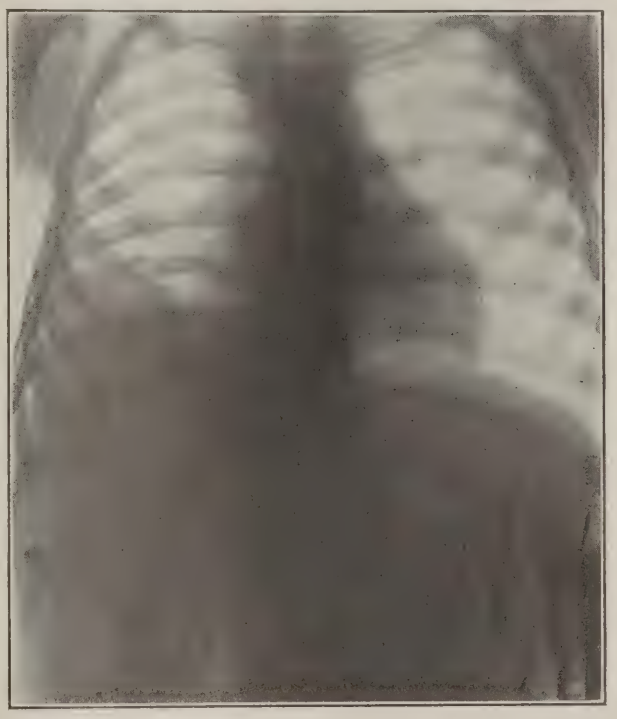

FIG. 18.—Shows how lung has expanded in only six days. Cannula was not replaced; only four paraffinated threads were used for drainage (threads secured by safety pin). Patient discharged cured twelve days after operation.

radical cure, while our method prevents pus production, thus hastening radical cure.

CONCLUSIONS

The filling of the pleural cavity with secretions, whether sterile or purulent, always represents the most valuable means of defense of the organism. This means of defense must not be hampered by early radical intervention. Secretions collected in the pleural cavity must be evacuated only when and after they have played their defensive rôle, and the *causa prima* is removed or its activity has ceased. Small quantities, however, should be removed for diagnostic purpose and to relieve pressure. The direct treatment of empyema must be based on expansion of the lung and simultaneous evacuation of the pus. The treatment of thoracic empyema, like any other pathological condition, requires some surgical skill and clinical experience. A direct method of treatment has been described which obtains simultaneous expansion of the lung and positive drainage; renders the treatment painless; shortens its duration from a few days to an average of two weeks, and prevents the complications commonly observed in cases of thoracic empyema.

Effusions Into the Knee Joint and Housemaid's Knee

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In no class of surgical cases commonly occurring is there less unity of opinion in the world of surgery today than in those cases involving the knee joint, in which there is a collection of fluid within the joint cavity. The common expression by which many of the laity understand this condition, is summed up in the expression, "water on the knee." This is a most unfortunate designation, for the reason that it has its influence on the mind of the medical profession and surgery itself. It has led to a gross misunderstanding of diseases, and injuries affecting the knee joint. To one person water on the knee does not convey to his mind anything serious. To another it is a matter of grave apprehension. In the rank and file of the profession there is no rational plan for handling these cases.

The fluid which may be in the knee joint may be serous, purulent, bloody or contained within the meshes of an edematous synovial membrane. The presence of a serous fluid may be due to trauma, infection from within the body through the blood stream, or irritation from some unusual exertion. Pus is always due to infection from some of the pathogenic organisms. It may follow trauma, or an infection from internal sources. Blood, or a bloody fluid, comes from three sources. First, and most frequent, severe trauma; second, infection from some of the hemolytic organisms; third, hemophilia.

The pneumococcus, and kindred organism—diplococci—at times invade the knee joint and cause a collection of serous fluid. Pus is not often associated with the condition. There may be no pain, no swelling of any appreciable consequence, no redness or rise in temperature. The synovial pouches of the knee joint will be distended by fluid within one or two days' time. Some time both knees will be simultaneously involved. Eventually pain will be present due to pressure within the overdistended tissues surrounding the joint. Seldom can we recover the infecting organism in these cases. If the effusion is detected within the first forty-eight hours, a culture will sometimes reveal the organism responsible for the condition.

I once removed fluid from the left knee of a young woman. She had known that something was wrong with her knee for nearly three weeks. She had no systemic disturbance whatever and while not a very robust woman, she had never been confined to bed by illness, except at the birth of her baby one year before the condition of the knee developed. Careful examination failed to detect disease elsewhere in her body. Her teeth were good, her tonsils negative. No evidence of a pathological condition existed in the entire abdominal region. The fluid when drawn from the knee joint was dark amber, but wholly translucent. Cultures of this fluid were negative. Within forty-eight hours her right knee was greatly distended with fluid. This fluid was very pale amber color. Cultures of this fluid resulted in pure growth of the lanceolatus of Frankel. This culture was of such vitality that subcultures were made from it for four months before being exhausted.

The gonococcus is responsible for many acute collections of pus in the cavity of the knee joint. Other infections rarely produce acute filling of the joint with pus, without an external injury communicating with the joint.

Tuberculosis of the synovial membrane, that has not extended to the other structures of the joint, may produce, first, a serous collection of fluid, which if not promptly removed will become purulent from mixed infection. Tuberculous effusions will occur again and again, until the diseased synovial membrane is completely removed. In 1910, in the San Francisco County Hospital, I had a man about fifty years of age, who gave a history of having severely wrenched his left knee, in leaping over a ditch, twenty-seven years before. His knee hurt him so badly at the time that he was laid up for about two weeks. Afterwards, although he suffered severely from pain in the knee, he went about his work as a laborer. He was large and muscular, but lean and except for the injury to his knee his health had been exceptionally good. He became a stoker on a steamship.

About ten years after the original injury he was in a hospital in San Francisco because of trouble with his knee. He said that at this time it was operated on twice, but he could not tell what was done at either time. There was no scar, or mark of a cutting operation about his knee. He said he was away from work for about four months.

In about seventeen years he again came to the San Francisco County Hospital and was placed in my service. Aside from his knee his general condition was good. He had led rather a rough life, but denied any venereal disease, or any illness that had confined him to bed aside from the knee. There was considerable fluid in the knee. There was also considerable thickening of the synovial membrane, both above and below the patella. The fluid from the knee was cultured. A growth took place in the culture medium, which responded to all of the tests for tuberculous bacilli. Guineapig test was positive for tuberculosis. I opened the joint and made an extensive dissection of all the diseased synovial membrane that could be found. There was no sign of pus, or erosion of any of the structures of the joint. The knee healed kindly, and in about three months the patient returned to his job as a stoker. I never saw, or heard of him again.

After an accident in which the knee is bruised and severely injured, without any penetrating wound an immediate filling of the joint with fluid, or filling within twenty-four hours, is always due to a hemorrhage into the joint. If the blood is not promptly removed, one of three things will happen. Secondary infection, with abscess, rapid organization of the blood clot with many adhesions of the overlaying soft structure, or a chronic involvement of the

joint with broken down blood clot, which will result in delaying convalescence, and possibly permanent crippling.

A history of hemophilia will give sufficient data on which to base a diagnosis of hemorrhage into the knee joint in such a patient. I shall make no comment on the handling of such a case. My own experience has taught me that proper handling of these cases has never been learned.

Serous fluid and blood due to trauma should be promptly removed from the knee joint by aspiration. This should be done under full aseptic precaution. No antiseptic fluid should be injected into such a joint. The best point at which to enter the synovial pouch, is just above the patella and just below the margin of the outer border of the quadriceps tendon. An assistant must make careful pressure above and below the patella, so as to bring the fluid into one common collection, just above the patella, during the aspiration.

The knee should then be encased in a light plaster of Paris dressing, over good absorbent cotton (never sheet wadding). A felt pad with a hole in it should be placed over the front of the cotton to prevent pressure on the patella. The plaster should extend from two inches above the ankle joint, to the gluteal fold, with the knee a trifle flexed. A short plaster of Paris dressing, just encasing the knee, is an evil thing under any circumstances. Moleskin plaster applied to the leg on each side and reflected over the bottom of the cast is essential to hold the cast from slipping down. Any attempt to apply the cast tight enough to prevent slipping when the patient stands, is exceedingly bad practice. Slit the plaster in front throughout its entire length at once.

As housemaid's knee often follows trauma, either from a blow over the prepatellar bursa, or irritation from being on the knees at some occupation I choose at this time to mention it in this article. In a true case of prepatellar bursitis the treatment should be radical. Conservatism has no place in this condition, providing the diagnosis is correct. If there is acute suppuration, the pouch should be freely opened, and drained from the most dependent point. The incision should not be made over the central portion of the bursa, but transversely, and at the lowest point, which will communicate with the bursa. As soon as the pus has cleared up a transverse curvilinear incision with the concavity upward, should be made so as to go just below the bursa. A flap should be turned upward, and the bursa dissected out, care being taken not to tear it into shreds, but to remove it in one mass. If this is not done a chronic condition will supervene, and recur with acute outbreaks. The knee joint may become involved. To temporize with one of these cases means depriving the patient of the chance to work until the infected bursa is removed. Aspirating a housemaid's knee is absolute folly. Sticking a needle into a cellular mass of edematous tissue is a quite successful way of infecting the whole mass, and productive of no good whatever. In the absence of acute pus dissect out the bursa at once. Do not ligate vessels with catgut. Either stop them with a silkwormgut suture, brought through the skin, and tied over a pledget of gauze, or stop them by application of a hemostat applied for a few minutes. Close the wound with a silkwormgut suture, without drainage in the absence of pus. Opening into a bursa at its central portion, and attempting to wash out with an antiseptic is dangerous practice. I have seen a sinus running halfway around the knee, together with a slough larger than a nickel around the original puncture following such a procedure.

I have seen suppuration continue for months following aspiration, and incision, without removal of the bursa. Careful and complete dissection of the bursa means one hundred per cent. cure, if done promptly.

528 Flood Building.

Vasomotor Rhinitis

With a Report of Eight Cases Reacting to Orris Root

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Brooklyn

The symptoms of vasomotor rhinitis are practically the same as those of acute simple rhinitis, or ordinary coryza. In both, there is a sudden access of sneezing, with fullness of the nose and throat, and an abundant discharge of watery mucus. The eyes become congested, the lids are swollen and red, lacrimation is increased, and there is a mild photophobia. The external nose is also swollen and red. Taste and smell are impaired and because of this the appetite also suffers.

From the nasal mucous membrane, the engorgment spreads to the accessory sinuses of the nose, to the pharynx, soft palate and uvula, the result being headache, difficulty in swallowing, itching and tickling of the roof of the mouth and an irritating uvular cough.

But while vasomotor rhinitis and acute simple rhinitis are symptomatically identical, they differ completely in their etiology; and due to the difference in their causative factors, there is also a great difference in their duration. Acute simple rhinitis is caused by an infection of the nasal mucous membrane, brought on by exposure to cold. Its duration is only about one week or ten days, while vasomotor rhinitis, according to its causes, may last for weeks, months, or all the year round, as the socalled perennial vasomotor rhinitis.

VARIETIES OF VASOMOTOR RHINITIS

Vasomotor rhinitis which is caused by the pollens of plants, the socalled hay fever or pollinosis, constitutes by far the largest group of cases. It is

well known that over a million persons in the United States, or about one in every hundred, suffer from hay fever.

In this group of cases, the duration of symptoms coincides with the duration of the pollination of the plant or plants to which these subjects are sensitive. So that a small number of persons, about one per cent. of all hay fever victims, who are sensitive to tree pollens, such as maple, willow, oak and horse chestnut, will have their attacks of vasomotor rhinitis from about the middle of March to about the middle of April, because that is the time when trees pollinate. Another group of patients, about seven per cent., who are sensitive to grass pollens, such as June grass, timothy, orchard grass and red top, will suffer from the beginning of May to the end of July; and the remainder, who are sensitive mainly to ragweeds, will have their pollinosis from about the middle of August to the middle of October. The cases caused by pollens are called seasonal vasomotor rhinitis.

Then there is a group of patients who complain of hay fever symptoms throughout the year, the so-called perennial hay fever. In this group there are a number of cases that are allergic, and the main protein to which these patients are sensitive is the protein contained in orris root.

In a series of twenty cases, which I have treated, there were eleven nonallergic, that is, not reacting to any protein, and nine allergic. In the allergic cases, there was only one patient who reacted to goose feathers. In the rest of the cases the vasomotor rhinitis was caused by inhaling the protein of orris root.

Orris root is a native of Italy, mainly near Florence, where it is dug up in the spring and after it is cleaned of its rootlets and outer layer, it is dried and ready for export. On account of its fragrance, it is pulverized and used in a good many cosmetics, such as face powders, perfumes, shampoos and soaps.

The causes of nonallergic vasomotor rhinitis are not well known. Some assert that it is due to some endocrine imbalance, but this has not been definitely proved. Others, again, think that all cases of vasomotor rhinitis are due to protein hypersensitivity, but in many cases the isolation of the responsible protein has not been successful.

TREATMENT

If it were possible to remove the patient from his specific protein or remove the protein from the patient, this would be the ideal treatment; no pollens, no hay fever; or no inhalation of other proteins, to which the patient is sensitive, no symptoms; but as a rule, this is impossible.

Pollens, in season, are in the air in great quantities, especially those light pollens of the grasses and ragweeds, which are borne even by an ordinary wind for miles and miles. And there are only a few places which are pollen free, such as the ocean and high altitudes.

The same thing can be said about orris root. While not every one uses cosmetics, yet they are so universally used, especially face powder, that the air is almost full of it and, therefore, we have to resort to desensitization treatment.

Desensitization is carried out in the following manner: An extract is made of the pollen or other protein to which the particular patient is sensitive; that is, if he is sensitive to the pollen of timothy grass, we make an extract of that pollen and inject it into him, beginning with very minute doses, which are gradually increased, so that at the end of the treatment the patient is desensitized. The same process is used with orris root, and in all other protein desensitization.

CASE HISTORIES

Case I.—Miss S. C., aged twenty-one, a schoolteacher, was sent to me by a well known rhinologist, on November 20, 1922, as a severe case of vasomotor rhinitis of two years' duration. She had visited almost every rhinologist in the city and was operated on for some pathological condition in her nose, but without relief. The last rhinologist whom she visited suggested protein tests. On being tested, she gave a strong reaction to orris root and we decided to desensitize her. On account of her extreme sensitivity, the desensitization took almost a year, but she has been completely free from symptoms since her tenth injection, and is perfectly well up to the present time.

Case II.—Miss S. K., aged seventeen, a student at Hunter College, came to me on October 25, 1923. She had been suffering from vasomotor rhinitis for a number of years, being considerably worse during the months of June and July. On being tested she reacted very strongly to orris root and also to two grass pollens. She was desensitized for orris root and also for the grass pollens. She has been perfectly well since.

Case III—C. M., aged twenty-two, milliner, came to me on April 24, 1923, suffering from perennial vasomotor rhinitis of a few years' duration. On testing her, I found that she reacted to orris root for which I desensitized her. She was greatly improved for about four months, after which time her symptoms returned. The peculiarity about this case is that whenever the patient is in the mountains, no matter for how long a time, she feels perfectly well.

Case IV.—Miss L. B., aged twenty, a salesgirl, was referred to me by a well known rhinologist to be tested for proteins, as she had been suffering for about a year and a half from the perennial type of vasomotor rhinitis, stating that there was no pathology of any kind to be found in her nose. She reacted very strongly to orris root. On June 8th, I completed her treatment and she has been well since.

Case V.—Mr. H. S., aged thirty-three, a printer, came to me on May 31, 1924, complaining of perennial vasomotor rhinitis, which had lasted for a number of years. He showed a pronounced reaction to orris root, but unfortunately I was unable to desensitize him, as the extract of orris root, prepared by a well known firm, happened to contain an excess of creosol, which is used as a preservative; and this inflamed his hand to such an extent that he was unable to work for about a week. Needless to say that he refused the continuation of further desensitization.

Case VI.—H. G., aged thirty-five, a manufacturer, came to me on May 25, 1924. He had suffered from hay fever of the autumnal type for the last seven years, with occasional hay fever like attacks all the year round. On testing him, he showed strong reactions to the pollens of both the giant and dwarf ragweeds and also to the pollens of sunflower. He was desensitized by a mixture of these pollens and he felt quite well during the entire hay fever season. After the hay fever season was over, I tested him for other proteins and I found that he was very strongly sensitive to orris root, for which I am now completing his desensitization. He has been practically free from all symptoms since his sixth injection.

Case VII.—Miss L. S., aged twenty, a dressmaker, came to me on July 31, 1924, with a history of suffering from the perennial type of vasomotor rhinitis for a number of years. Orris root was the only protein she reacted to and very strongly at that. I completed her desensitization November 21st and she has been absolutely well since the beginning of her desensitization, in spite of the fact that she has been using face powder.

Case VIII.—Mrs. R. H., aged twenty-eight, a housewife, came to me on July 10, 1924. She had suffered from vasomotor rhinitis for the last two years. On being tested she gave a very marked reaction to orris root. I have just completed her desensitization, but Mrs. H. has been free after her tenth injection, excepting a mild attack, which was caused by using a shampoo which contained a good deal of orris root. At present her reaction to orris root is negative.

Purulent Pericarditis in Childhood*

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(*Concluded from page* 484)

CASE REPORT

History of Case.—March 25, 1923. The patient was a male, white, four years and nine months of age. Ten days previously, following what, according to description, was rubeola, the child had become worse, and suffered from high fever, cough and pain in the abdomen and back. The physician in charge had made a diagnosis of bronchopneumonia.

At the first visit, March 25, 1923, the patient's condition was as follows: He complained of cough, and pain in the epigastrium. There was fullness of the latter. Temperature 102.4°. No vomiting; bowels constipated; soreness in abdomen and back; throat reddened; postnasal mucopus; tonsils large; no evidence of ear disease; no desquamation; fine râles in the left lung posteriorly; urine contained albumin. A diagnosis of bronchopneumonia of left apex was made and treatment instituted accordingly. The next day the temperature had fallen to 99° and the general condition was somewhat improved. For several days the child's condition remained the same. Then a rise in temperature was noted in the afternoon (100-101°) with constant complaint of persistent pain and tenderness in the epigastric region. The heart sounds were clear, the apex visible and palpable in normal position; no increase of cardiac dullness noted. Of particular interest was the sighing respiration of the child.

On April 6th, his general condition became distinctly worse and we concluded that an empyema was present and advised admission to the hospital for x ray and exploration.

Hospital Notes.—L. P., aged four years, nine months, was admitted to the Howard Hospital April 8, 1923.

Chief complaint: Epigastric pain, swelling under eyes and distention of the abdomen.

Family history: Father and mother living and well. He was the only child.

Examination: Eyes, pupils equal, reacting regularly to light and accommodation; no ocular palsies; no exophthalmos. Ears, no evidence of disease. Mouth, tongue slightly coated; teeth normal for age. Pharynx congested; tonsils not cryptic; subtonsillar glands merely palpable; no mastoid tenderness; no edema of skin over mastoid. Some edema of face. Neck, no abnormalties. Chest, expansion good and equal, no gross deformity. Lungs, percussion note resonant, though some slight impairment at left apex. Breath sounds bronchovesicular at right apex; somewhat prolonged posteriorly; no râles. Voice sounds normal. No bulging of interspaces. Heart, a visible, rather diffuse cardiac impulse, which was easily palpable and was simultaneous with systole. There were no audible murmurs, no arrhythmia, no displacement; heart muscle tone was good. Abdomen, somewhat distended. There were no areas of tenderness, or palpable masses. A movable dullness was present in the flanks with a tympanic area in the midline, probably due to some fluid. The peristalsis was normal. There was no hernia present. There was perhaps a slight edema in the lumbar region. Extremities, no edema, no gross abnormality. Temperature, 103°.

April 9th: Dullness over left apex in front and laterally; posteriorly, the note was hyperresonant. Abdomen distended, but not tender or rigid. Dullness in both flanks, disappearing when the child was turned on the side. Apparently some peritoneal effusion. Urine contained a trace of albumin and a few hyaline casts. Blood count was as follows: Erythrocytes 4,120,000, leucocytes 15,400, hemoglo-

*Read before the Section on Pediatrics of the Medical Society of the State of Pennsylvania, October 7, 1924.

bin 80 per cent., polymorphonuclears 50 per cent., lymphocytes 50 per cent. X ray showed effusion of left chest, which was totally opaque up to the level of the third rib posteriorly.

April 10th: Dullness over lower left lung posteriorly.

April 11th: Dullness over left lung increasing.

April 12th: Exploring needle inserted in the seventh interspace, postaxillary line, and sixty c.c. of serum withdrawn, without anesthesia. Light ether anesthesia was then induced. Exploring needle inserted in second interspace just outside of nipple line drew pus. Incision; two rubber tubes introduced for drainage between second and third rib.

April 15th: No drainage. Upper tube removed; lower tube shortened.

April 16th: Tube shortened; only suspicion of drainage, but general condition not improved. Pus from chest was sterile after ninety-six hours. Direct smear showed many pus cells and a few streptococci. Culture grew streptococci, nonhemolytic, and staphylococcus aureus, probably contaminated.

April 17: Tube removed; exploring needle inserted perpendicularly through wound and 140 c.c. of pus were withdrawn. The position of the needle, the depth to which it was inserted and the fact that each heart beat could be felt by the hand holding the syringe led to the diagnosis of pus in the pericardial sac. Further operation was postponed as permission of the parents had not been obtained for a major operation.

April 19th: The x ray showed "a decided decrease in size of area reported eleven days ago. While it is true that this shadow has the waterbottle shape of a pericarditis with effusion, the cardiohepatic angle is not obliterated and the density of the shadow is not uniform, it being more dense in the left than in the right. There is a definite increase in width in the mediastinal shadow which extends up above the level of the clavicle. This mediastinal shadow could be caused by glandular enlargement."

April 20th: Impaired resonance, one finger's breadth to right of sternum reaching up to clavicle; apex beat not visible. Heart sounds muffled, mitral sounds heard best at fourth interspace, one cm. within nipple line. Aortic sounds extremely muffled, no murmurs heard. No difference in the measurement of each side at nipple line.

April 21st: Ether anesthesia. Incision through site of old wound after antiseptic preparation and tincture of iodine application. The left third rib was exposed in the nipple line by transverse incision, and about one and one half inches of bone resected subperiosteally. This revealed a bulging tumefaction, which upon being opened discharged about two hundred and fifty c.c. of yellow pus. The cavity was irrigated with warm saline solution. The examining finger passed through the incision came in immediate contact with the heart. No drainage was inserted, and the wound was not sutured, being left open to insure free drainage. The general condition of the child remained satisfactory through the operation. The respiration at the time of opening the pericardial sac was 36; after evacuation of the pus the respiration was 56. No cough or other signs of pleural irritation occurred. X ray examination after operation showed a marked diminution in the size and density of the shadow. The upper mediastinal shadow still persisted.

April 24th: The drainage had become scant and it was found that the wound had become partly closed. It was freely opened with the finger and a considerable amount of yellowish pus evacuated. The wound was irrigated with Dakin's solution and dressings reapplied. The general condition remained unchanged.

April 25th: The discharge was still scant. The wound was again divulsed and a drainage tube inserted, through which a free discharge of pus was evacuated. The sac was again irrigated with Dakin's solution.

April 26th: Free thin purulent discharge, the tube was reintroduced and Dakin's irrigation repeated.

April 30th: Gradual lessening of discharge. General condition good.

May 1st: X ray report was: "The heart and mediastinal tissues are retracted to the left so much that the right border of the heart does not project beyond the right sternal border. The pericardial shadow is probably less dense than it was."

May 3d: Practically no discharge. General condition improved.

May 6th: Wound healed over. Condition very good.

May 12th: Pulse 100, full, regular. Heart sounds normal in quality and intensity. Heart dullness normal. A few moist râles at base of left lung. Slight impairment at left base; thickened pleura.

SURGICAL CONSIDERATIONS

The surgery of the pericardium naturally falls under two great heads—traumatic and elective.

The traumatic is wholly emergency and the operator is generally confronted with a more or less serious proposition, depending upon the damage done to the heart muscle and contiguous structures, coincident with the wounding of the pericardium. The degree of uncontrolled hemorrhage, together with that already sustained, generally decides the issue. Simple suture, preferably through the original wound, enlarged, if necessary, with the evacuation of any retained blood clot within the pericardium together with drainage (flexible preferred) constitutes the proper surgical treatment.

The elective surgery covers a much wider field and much remains to be said. A late diagnosis being generally the case, the operative procedure is necessarily fraught with much danger and this danger is in direct ratio to the time of the diagnosis and the complications present. Pericardiotomy in a strong well child assumes no graver aspect than thoracoplasty would in the same subject, and in both it might be said that the operative risk is practically nil. But in the highly septic, moribund patient the doors of heaven are gaping widely, ready to receive your patient. Early diagnosis of pericarditis with effusion, either serous or purulent, is the only factor that will cut the sixty per cent. mortality. All work done must be rapid, nontraumatizing and as shockless as is possible, for by far the great majority of these patients have but a fine thread holding

them to this existence and the mortality will be lessened by better technic.

The embryological aspect of the pericardium is rather interesting and makes the conception of its pathology comparatively simple. The pleural and peritoneal cavities are developed by a budding process from the body cavity. Later another budding process takes place from the pleural membrane or cavity, which develops into the pericardium. A bar arises and gradually inserts itself between the pleural and peritoneal sacs, eventually separating the two cavities. Hence, we may safely say that within certain limits the pathology of the pericardium will be that of the pleura and in all likelihood their diseases with some modifications will be the same. There is a divergency in this analogy in one respect, and while we shall speak of this later, it may be well to finish the comparison of the two membranes at this time. The subserous layers of the visceral pleura have only a few fibrous bands continuing into and becoming a part of the interlobular structures of the lung, while the visceral pericardium is closely and intimately related to the intramuscular septi. This proves of great pathological importance in pericarditis, particularly of the purulent variety.

Histologically the pericardium is a serous sac which encloses the heart and the proximal portions of the great vessels. It consists of two layers, one of which, the visceral layer, closely invests the heart and at its base becomes continuous with the parietal layer, within which it is invaginated. It is to be noted that the visceral layer is an exceedingly thin membrane and is throughout its extent so closely adherent to the outer surface of the heart that any attempt to detach it results in injury to the heart musculature. In fact, so close is this relation that many of the fibrous bands of the subserous coat are continued into and become integral with the intramuscular bands of the heart, similar to the close relation existing between the fascia lata and the intramuscular septi in the leg. There is a break in this close relationship and some fat may lie between the visceral layer and the heart over the ventricle and anterior surface. The parietal layer is much stronger than the visceral and forms a sac, the base of which rests upon and is attached to the diaphragm, while its apex surrounds the roots of the aorta and pulmonary artery. The two layers are in close proximity, save at the base where a small cavity exists containing liquor pericardii. At the sides and along a considerable portion of the sac, its anterior surface is in close proximity to the pleura. The upper part of the anterior surface where it covers the aorta is free from this contact; the lower anterior surface lies posterior to and is loosely attached to the sternum. Posteriorly, it is free to a considerable extent from the pleura, that portion covering the posterior surface of the left auricle resting upon the esophagus and the thoracic aorta. The point at which union takes place between the visceral and parietal layers corresponds to the upper margin of the second costal cartilage (39).

All authorities are agreed, that there is a great variation in the line of the reflection of the pleura and pericardium. Sick (6) reports that in adult findings in twenty-three cases, the pleura reflections at the level of the fifth cartilage lay either at or within the left border of the sternum in seventeen; at the level of the sixth, the pleural border had not gone beyond the sternal border in ten; at the level of the sternal articulation of the seventh in nine cases they were at the sternal border. Eleven children out of twelve, according to the same author, showed the pleural edge at or within the sternal border at the fifth costal cartilage; at the level of the sixth the pleura had not left the sternal border in eight children (6). Brooks, Luschka, Delorma and Mignon, and Dwight found the pleural margin either within or at the border of the sternum at the fifth costal cartilage in all their cases. The internal mammary artery throughout the first six interstices follows along the border at a distance of from one half to two cm.

As has been previously stated, a delayed diagnosis makes for a high death rate in the surgery of purulent pericarditis and to a less degree in the serous variety. The visceral pericardium being so thin, so intimately connected with the cardiac muscle, and the subserous coat sending so many fibres into the intramuscular septa, favors the advance of any septic process from the pericardial sac, by direct continuity of tissue, into the intramuscular septa and from here leading to an involvement of the musculature itself. Local abscesses are then the possibility and, if delayed, the probability, in all purulent pericarditis. Hence, you have to deal with a weakened heart muscle in every instance. This, in itself, forms no mean obstacle to successful surgery.

Of course, a diagnosis is essential and much has been said upon the subject of exploratory puncture of the pericardial sac. We believe this can be dismissed with a few words. It is a procedure not without some danger. To say that it is never advisable would argue for a diagnostic acumen which, unfortunately, has not been reached by most of us. To those so favored that a diagnosis is possible without recourse to this procedure, it may be unwarranted. To others, not so favored by an unerring diagnostic ability, it often becomes necessary. Owing to the fact that the heart occupies a downward and anterior position within the pericardial sac, the exploring needle is quite apt to injure the muscle and actually penetrate the left ventricle. While this might not cause much damage *per se,* it is at least undesirable to force pus and microorganisms directly into the blood stream.

Anesthetics in these cases must be administered with great caution. Local anesthesia theoretically is ideal, but in many hands does not work out. Ether and pus always make a lethal cocktail, the deadliness of which is proportionate to the degree of sepsis present and the amount of ether used. Ether, though, in experienced hands (and by this we mean experienced) seems essential in children. Nitrous oxide and oxygen have their place with adults and should generally precede ether at any rate. An adequate exposure of the pericardium is desirable in all operative procedures.

Many lines of attack have been suggested; some may be mentioned only to condemn them. Trephining of the sternum is unnecessary, does not furnish an adequate exposure and its margins are too inflexible. An incision over the xiphoid angle may involve

the diaphragm, may open the peritoneal cavity, and should the pus be loculated, of which there are cases on record, may result in not bringing the accumulation into a position to be tapped and drained. Resection of one or more of the costal cartilages then seems the only reasonable method of attack. It has all the good points and fewer of the bad ones than either of the others. True, there is danger of opening the pleura, but by careful dissection this can be successfully guarded against. Having decided, then, upon this method of approach, the operative procedure resolves itself into a few elementary steps.

1. Incision over the fifth or sixth costal cartilage about two and one half or three inches long, curved or straight at the discretion of the operator.
2. Strip back the periostum from the cartilage.
3. Reset the cartilage for adequate exposure and, if necessary,
4. Ligate the internal mammary artery above and below.
5. Retract the pleural overhang.
6. Incise and drain the exposed pericardium through the smallest possible niche, thus allowing a long time to elapse during the process of evacuation.
7. Investigate by palpation for any loculations or adhesions.
8. Drain.

The last of these steps is open to discussion. Whether or not the pericardium should be sutured to the wound edge or the skin for permanency in drainage will depend upon the circumstances governing each case. As a rule this procedure is not practical. Tube drainage is objectionable and is not advised. A rubber dam (rolled) changed daily, may be used, the result aimed at, of course, being adequacy of opening, maintenance of the opening and selfdraining facilities of the wound.

In the case here reported no drainage was used, the position of the patient being depended upon. By position is meant that the child was kept upon the left side, face down and feet elevated. As is seen by the records this proved to be quite satisfactory.

We cannot consider the case under discussion as being in any way typical of the condition under discussion. In the first place, this child had a complicated empyema of the pleura, which of itself is not extremely unusual. This we drained a few days prior to the discovery of the pericardial complication. Secondly, exploratory puncture failed to draw pus in the lower interspaces and it was not found until we tapped between the third and fourth cartilages. This fact made us feel rather uncertain as to the correctness of our diagnosis, as the loculated empyema of the pleura which we previously operated upon was in this location.

Because of the fact that we failed to recover pus in the lower punctures the incision (simply an enlargement of the previous thoracoplasty) was made over the third costal cartilage which was resected. After our dissection was completed, the edge of the pleura immediately came into view, the pericardium bulging very tensely, under great pressure. The pus in the sac was very slowly evacuated, and as said before, no drain was used.

We have never been able satisfactorily to explain our failure to get the pus in our lower punctures. We might ask ourselves, and properly too, what relation the preexisting (or was it preexisting?) pleurisy had to the pericarditis and thereby get into that old argument as to the possibility of a transmission of infection from the pleural cavity to the pericardium by direct continuity of tissue. Of course, this is undoubtedly possible, but does it happen? There seems much to say on both sides of the question and the difference of opinion held and fought over for the past decade still leaves us in doubt. We are of the opinion that direct infection rarely takes place and that most of the purulent infections of the pericardium are of metastatic origin. Yet here is a case in point which seems on its face rather to favor the other theory and to be one of the very unusual cases.

The authors' references will appear in their reprints.

Osgood-Schlatter Disease

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Osgood-Schlatter disease is a disease localized in the tubercle of the tibia, characterized by swelling, tenderness and pain referred to the region of the tubercle of the tibia, with x ray findings revealing a wormeaten or eroded tubercle instead of a normal beakshaped tubercle, and usually follows overexertion or direct injury.

The ossification of the tibial apophysis occurs mostly between the twelfth and the fifteenth year. Between the first appearance of the bone nucleus and the completion of ossification, not more than three to four months are required. Only a thin cartilage zone remains between the tuberosity and the tibial diaphysis to about the eighteenth year. The apophysis sends a process over the anterior surface of the head of the tibia while from below an independent bone nucleus grows against it until, at the level of the epiphyseal disc, the fusion occurs. Schlatter concludes that there are extrinsic factors which contribute to this condition, for instance, that the ossifying apophysis is easily exposed to direct and indirect traumatism, especially at the point of junction between the upper or the lower apophysis.

Thompson reports a periostitis at the point of insertion of the ligamentum patellæ caused by a pull of the quadriceps.

Kienbock, upon the basis of his radiological findings, concludes, at least for some of the cases, that there exists an active destruction of the bone of the tuberosity together with an inflammatory

*Cases presented before a meeting of the Alumnæ Society of Lebanon Hospital, January 9, 1923.

FIG. 1.—Affected tubercle of the tibia. Note the irregular appearance of tubercle. Case I.

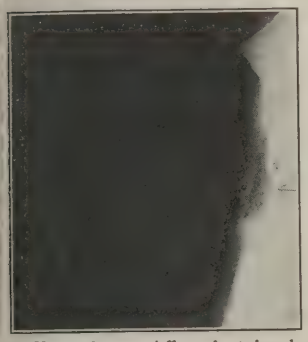

FIG. 3. — Affected tubercle (right). Note the enlargement and irregularity. Case III, H. R.

FIG. 5. — Affected tubercle (right). Note the irregular appearance of tubercle. Case II.

FIG. 7. — Affected tubercle (right). Case IV, E. R.

reactive swelling, in other words, an osteochondritis.

Ebbinghaus considers the condition as an epiphysitis dessicans traumatica. So it appears that the views on the etiology of this condition are by no means in harmony.

Bergemann pointed out that, aside from inflammatory changes, pathological changes of ossification analogous to those seen in late rickets are to be found.

Similarly Fromme, in a comprehensive clinical review, found that in a number of cases with late rickets the patients showed the signs of Osgood-Schlatter's disease, deducing from it that this disease occurs in the majority of patients afflicted with late rickets.

Hinrichs points out that if severe changes are seen in long bones in regard to ossification and growth, in a person afflicted with late rickets, such would also have to be expected to occur in the tibial apophysis where a comparatively thin bone plate rests upon a thick layer of cartilage. The pull of the quadriceps tendon may easily lift the process off its cartilage base and cause a kinking of the base of the apophysis. Severe signs of late rickets existed in all the cases which were studied. He concludes that Osgood-Schlatter's disease, in many cases at least, is merely a symptom of late rickets.

In our series of five cases there were no signs or symptoms of late rickets in any. There was a distinct history of injury in every one.

Osgood-Schlatter's disease occurs in a portion of the tibia which by virtue of its anatomical configuration and its exposed situation is especially open to direct or indirect traumatism. In all the cases in which the changes occur without traumatic influence, one should think of late rickets.

Usually there is a definite history of trauma, either direct or indirect, through striking the knee or through a sudden violent strain of the quadriceps muscle, such force causing separation of the fibres of the patellar tendon at its attachment to the upper diaphysis of the tibia and the tibial tubercle, which in adolescence is usually a beaklike projection from the upper epiphysis, overlapping the upper end of the diaphysis in its anterior portion and is separated from the diaphysis by cartilage.

The direct fibres of the patellar ligament are attached to this beaklike projection of the epiphysis, and, in addition, radiating tendon fibres are traced in a fanshaped distribution to either side attached to the tibial diaphysis. From this fanshaped distribution of the patellar tendon fibres it can be understood why the force applied does not produce a total inability of extension of the injured leg. In all cases there is some power of extension following such an injury, though this ability is greatly reduced and painful. This maintenance of partial ability to extend the leg following the injury is attributed to the remaining unruptured tendon fibres or to sprain or partial fracture of this tibial beak only.

The local swelling is attributed to the increase of bursal fluid set up by the trauma to the bursa lying between the ligament and the tubercle, plus infiltration resulting from the tearing of the ligament fibres and direct tissue damage. In comparing the injured knee with the normal knee one should remember that Osgood-Schlatter's disease may be bilateral; in such

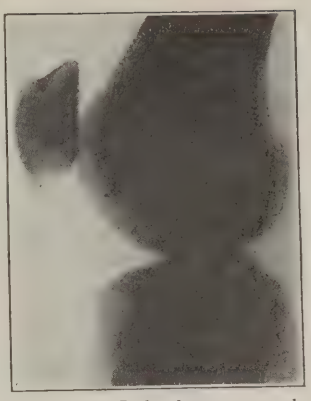

FIG. 2.—Left knee, normal tubercle of the tibia. Note the beaklike appearance. Case I.

FIG. 4.—Normal tubercle (left). Case II, H. S.

FIG. 6.—Normal tubercle (left). Case III, H. R.

FIG. 8. — Affected tubercle (right). Note the eroded appearance of the tubercle. Case V.

instances both x ray pictures being alike would naturally be called normal. In unilateral cases both knees should be x rayed so that the affected side could be compared with the normal one.

The chief symptoms of this condition are swelling, limping, local tenderness, inability to extend the affected leg fully, especially evident when walking up and down stairs.

In considering the differential diagnosis, an acute osteomyelitis or bone abscess might develop in this region, but a careful history and usually the presence of temperature, leucocytosis and x ray findings would rule this out.

Tuberculosis of the tubercle may also develop in this region, but the symptoms would not be so strictly localized and the progress of the disease, with bone destruction and x ray, would exclude this.

A bone cyst developing beneath the tubercle would give analogous symptoms, but a carefully studied radiogram would render the diagnosis unmistakable.

Pretibial bursitis would be very difficult to distinguish from disease of the tibial tubercle. If fluctuation could be determined or fluid obtained by aspiration, this would determine the case in favor of bursitis.

In the treatment of these patients the crisscross strapping with adhesive is usually sufficient. They do not suffer enough to justify keeping them in bed or even using a plaster cast or apparatus. They are, however, annoyed for weeks or months by the pain of complete flexion or extension, or when walking up stairs. They should be forbidden to indulge in rough sports.

The prognosis is uniformly good as to the end result, but the enlargement of the tibial tubercle may persist.

CASE REPORTS

Case I.—L. H., thirteeen years of age. Six months ago (prior to his visit to the office), the patient fell striking his right knee against the pavement. Shortly thereafter he noticed swelling of the upper part of the leg. He also complained of pain which he referred to the region of the tibial tubercle. The pain was aggravated whenever he walked up the stairs.

Examination disclosed a circumscribed swelling about the size of a silver quarter in the region of the tibial tubercle. Tenderness which was excruciating was also localized to the same area. Extreme flexion and extension were somewhat restricted and painful.

A tentative diagnosis of Osgood-Schlatter's disease was made and subsequent x ray pictures confirmed the diagnosis. (Figs. 1 and 2.)

Case II.—H. S., fifteen years of age. During the past two years the patient had bumped his right knee against the edge of a chair, on several occasions. The first few times the symptoms were so mild that he paid no further attention to the condition of his knee. After the last trauma had been sustained he noticed a swelling at the upper part of the right leg, which swelling was increasing. It was this increase in size of the swelling that urged him to seek advice. He complained of slight pain especially evident when he walked up stairs. He never noticed any redness in the affected region. Examination disclosed a circumscribed swelling slightly larger than a silver quarter localized to the tibial tubercle region of the right side. This area was somewhat tender. Extreme flexion and extension were restricted and painful. A diagnosis of Osgood-Schlatter's disease was made and subsequent x rays confirmed the diagnosis. (Figs. 3 and 4.)

Case III.—H. R., fourteen years of age. Ten days before his first visit, the patient, while walking came down forcibly on his right foot during which time he said he felt a sudden tightening of the muscle on the front of his right thigh. This was probably a sudden contraction of the quadriceps muscle. Shortly thereafter he experienced pain which he referred to the region of the tubercle of the right tibia. He also noticed that this area was swollen. Examination disclosed a circumscribed swelling about the size of a silver quarter localized in the region of the tibial tubercle. This swelling was very tender. Extreme flexion and extension of the knee were restricted and painful. There were no redness or constitutional symptoms present. A diagnosis of Osgood-Schlatter's disease was made and subsequent x rays confirmed the diagnosis. (Figs. 5 and 6.) In this case the etiological factor was the violent contraction of the quadriceps muscle.

Case IV.—E. R., thirteen years of age. Several weeks prior to the patient's visit, he fell striking his right knee against the floor. Shortly thereafter he experienced pain and noticed swelling in the region of the tubercle of the right tibia. Examination disclosed a circumscribed swelling in the region of the tibial tubercle, which swelling was about the size of a silver quarter. It was very tender. Constitutional symptoms and local redness were absent. A diagnosis of Osgood-Schlatter's disease was made and subsequent x ray confirmed the diagnosis (Fig. 7).

Case V.—J. R., twelve years of age. Six months prior to his visit, the patient fell and hurt his right knee. Shortly thereafter he experienced pain and slight disability. The disability and the pain gradually disappeared. The swelling, however, persisted and it was for this that he sought relief. Examination disclosed a circumscribed swelling in the region of the right tibial tubercle. Slight tenderness was also present in this area. There was no limitation of motion in the knee. Local redness and constitutional symptoms were also absent. A diagnosis of Osgood-Schlatter's disease was made and subsequent x ray picture confirmed the diagnosis (Fig. 8).

SUMMARY AND CONCLUSIONS

1. Osgood-Schlatter's disease is also known as starting of the epiphysis, acute epiphysitis, periostitis tuberositatis tibiæ, apophysitis tibiæ.

2. It occurs in children between the ages of ten to fifteen years. It is more common in boys than in girls.

3. In children under ten years of age there is no separate centre of ossification. The centre appears earlier in girls than in boys. It may appear earlier or be further developed over one tibia than the other. The separate centre for the tubercle begins to unite about the fifteenth year, usually earlier in girls than in boys and is generally firm by the eighteenth year.

4. Trauma plays an important rôle in the etiology. Symptoms or signs of late rickets were not present in any of the cases of this series.

5. Simple strapping is all that is required in treatment.

6. The prognosis is good as to end result, but the enlargement of the tibial tubercle may persist.

7. The condition is in many respects analogous to the similar condition in the hip often called Perthes' disease. Especially is this true of the radiographic appearance of the epiphysis in the two conditions. Both conditions occur in adolescence; the symptoms are moderate pain and tenderness and only partial loss of function. They are both self-limited diseases and usually recover without causing any serious or permanent damage to the parts affected. Kohler's disease or isolated disease of the tarsal scaphoid pursues a similar course.

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The Bleeding Nipple

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The two following cases have induced me to make a few remarks on bleeding nipples.

Case I.—The patient, a female, aged thirty-seven years, entered the hospital in July, 1922, on account of bleeding from the left nipple, which began four months previously, although during the first three weeks the liquid was serous in character. There was no pain and no tumor could be detected. Examination merely revealed a bloody discharge from the nipple, staining the linen, while careful palpation failed to detect any distinct tumor. The nipple was supple and not retracted. The right breast presented nothing abnormal. There were large lymph nodes in the left axilla, but in the right only a small one, of no consequence.

As there was no distinct evidence of a growth in the breast, some hesitation was experienced as to the proper treatment, but on account of the bloody discharge and enlarged axillary lymph nodes, complete removal of the breast was done as a dendritic carcinoma was suspected. Examination of the specimen showed a small, flattened, lozengeshaped growth lying under the nipple. Histologically, the neoplasm was a metatypical intracanalicular carcinoma of the breast.

Case II.—The patient, a female, aged fifty-five years, entered the service of Professor Chavannaz, complaining of her left breast. She said she had always enjoyed excellent health, but about three years ago she was hit on the breast with the handle of a broom, which gave rise to much pain. This pain persisted until she was obliged to consult her physician, who found nothing but a small lymph node the size of a pea. He reassured the patient; the pain subsided, and she resumed her work. About eight months later a discharge of blood was noted, amounting to a few drops which soiled the linen. This lasted a couple of days and was followed by intense pain in the breast. She again consulted her physician, who prescribed an antiphlogistic ointment. The pain subsided but from that time on the little tumor increased in size, with occasional shooting pains in the breast.

In December, 1922, the pain became particularly severe and constant, so that the patient was admitted to hospital on January 20, 1923. The bleeding from the nipple had not recurred. Upon inspection, there was seen a slight tumefaction in the superoexternal quadrant of the left breast. By palpation a circumscribed hard mass could be felt, somewhat adherent to the overlying tissues, but movable over the underlying structures. The nipple was slightly retracted and the surrounding skin was a little puckered. There was a large lymph node in the left axilla. The right breast and axilla were normal. Operation was performed on January 25, 1923.

The specimen presented the characteristics of a carcinoma of the breast of the encephaloid type, with a rather rapid evolution. Histologically, epithelial masses were many and fully developed, being fed by a fragile fibrovascular stroma, especially the central parts of the neoplasm. Some cells are quite large, regular, and polygonal in shape, but others were small and invariably atypical. In other parts of the growth they retained a cylindrical shape with a commencing organization into glandular tubes. There were many islands of necrosis and one of the most important foci was the seat of a true hemorrhagic infiltration, the central part being absolutely liquefied. The walls were infiltrated with blood, especially the segmentary islands of hematic origin. A diagnosis of encephaloid carcinoma of the breast, with necrosis and hemorrhage in a focus of necrobiosis, was made.

Loss of blood from the nipple may be due to various affections, such as mastitis and aciniform carcinoma, but they are unquestionably exceptional. In some few cases loss of blood from the nipple results from benign intracanalicular papillomatous growths, but the most frequent cause of all is endocanalicular dendritic carcinoma.

Little need be said in respect of the predisposing causes of this symptom. It is most common between the age of forty to fifty years; one patient was thirty-seven, seven patients were between forty and fifty, while three others were over fifty. All the cases with which I am familiar occurred in women, most of them multiparous and having nursed their offspring. It has seemed to me that in some instances there was a relationship between menstruation and the loss of blood from the nipple. As reported cases show, this bleeding is nearly always the only symptom which attracts the attention of the patient. The discharge varies, sometimes being a serous fluid of a rusty red color, but usually it is frankly bloody. It may be fairly abundant or occur as a continued or intermittent discharge. There is rarely any pain in the affected breast, but pressure on the nipple may sometimes be painful. In a few cases the serous discharge

may precede the appearance of the blood for some little time, or possibly follow or alternate with it.

The presence of this symptom should at once lead to a careful inspection and palpation of the breast involved, in order to detect other symptoms which offer themselves. In the first place, no tumor or enlarged axillary lymph nodes can be detected, as in a case reported by Cabanne. The breast and axilla were normal, both by inspection and palpation, and it was only by pressing the nipple that some drops of blood could be made to flow out.

In my first cases there were a few enlarged lymph nodes in the axilla, palpation of the breast revealing nothing. In other instances a tumor will be found in the breast having all the characteristics of cancer, or at least offering distinctly suspicious characteristics of malignancy. Lastly, the growth may be encysted, as occurred in my second case. Usually the discharge of blood appears before the growth can be detected. In Professor Bégouin's case it was only after eight years that a small tumor was found in the breast, while in my second case the neoplasm was present several months before the blood from the nipple appeared, but this is most infrequent.

As the diagnosis, prognosis, and treatment are closely related to a bleeding nipple, it is proper to consider its clinical significance. Several conditions are met with in practice. There is a bleeding nipple and a growth in the breast. Occasionally the growth offers all the signs of a malignant process, viz., diffusion, adhesions, retracted nipple, and enlarged axillary lymph nodes, a typical picture of cancer of the breast. In these circumstances no hesitation is possible as regards prognosis and treatment. Operation must include the removal of the breast and contents of the axilla according to modern technic. In other cases the growth detected with a bleeding nipple is encapsulated, freely movable and not offering the characters of cancer, but rather those of a small cyst, frequently seated under the nipple. Now, although the physical characteristics of the tumor are not those of cancer, the bleeding nipple settles the diagnosis of intracanalicular dendritic carcinoma, and a radical operation is indicated.

There is a bleeding nipple without a tumor in the breast. This state of affairs may be embarrassing, but pathology shows that in the vast majority of these cases this symptom is due to dendritic carcinoma. In few instances is the loss of blood from the nipple dependent upon a mastitis or benign growths in a galactophorous duct. If the axillary lymph nodes on the affected side are different from those on the normal side, even when no growth in the breast is clinically appreciable, the coexistence of suspicious lymph nodes and a bleeding nipple should lead the practitioner to make a diagnosis of carcinoma.

When there is a bleeding nipple without tumor of the breast or enlarged axillary lymph nodes, the most prudent thing to do is to operate, because the chances are that the process is an intracanalicular carcinoma. This is especially true if the patient is over thirty-five and cannot be closely watched.

The Diagnosis of Acute Conditions of the Brain

With Special Study of the Spinal Fluid and Reference to the Child

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New York

(*Concluded from page* 460)

HEMORRHAGIC ENCEPHALITIS.

When we examine other forms of encephalitis, namely, secondary encephalitis—hemorrhagic encephalitis,—as the condition is come upon in the infections, etc. (for full details, cf. 1), we find the spinal fluid either entirely negative or slightly blood tinged—occasionally strongly bloodtinged. Where the process has been severe, we know that considerable secondary bleeding (hemorrhage) may occur. There may be pressure or not. In other words, the spinal fluid in these cases determines nothing—though it may help our diagnosis per exclusion.

The onset of the condition may be described as follows:

During the course, or near the end, of one of the infections, there is a sudden rise of temperature (sometimes a chill), and with this, the appearance of general brain symptoms, i. e., headache, vomiting, a convulsion, followed by sopor or coma, with delirium after the coma subsides. For a day or two before, prodromata of malaise, headache, dizziness, or somnolence may have been noticed. In children, fever, vomiting and convulsions almost always occur; in adults, convulsions may be absent, as likewise temperature (the last frequently absent, it will be remembered, in poliomyelitis and poliencephalitis, i. e., Heine-Medin disease, sometimes absent in the epidemic form, and usually absent in the Wernicke type). The temperature comes down after a few days—though occasionally it may persist considerably longer. At times, yet rarely enough, there are cases in which sudden paralyses are noticed, with scarcely any previous indisposition. Holt even mentions a child going to bed as well as ever, awaking in the morning hemiplegic. There may be a single convulsion or a series (general, halfsided or Jacksonian), after which it is noticed that the child does not use its arm, has a facial paralysis (XIX) or is aphasic (XX); or this is first noticed after the coma, if present, lets up and consciousness returns. For the most part, pareses or paralyses are present by the second, third or fourth day, a matter of considerable importance in the differential diagnosis. During the early sopor or coma, a tremor may be seen in a limb, or choreiform movements, or jactitations (i. e., cortical irritation), usually in the limb later to be

found paralyzed. Or weakness in a limb is first noticed, which gradually becomes distinctly paretic, and then paralyzed (the paresis or paralysis being accompanied by hypertonus or spasticity). The involvement is, for the most part, *hemiplegic* (with involvement of the face; occasionally it is diplegic, rarely monoplegic).

Where there is a bloodtinged spinal fluid, one will always keep in mind the possibility of injury to vessels in making the puncture. However, the secondary encephalitides may show the same, especially influenzal encephalitis. An unusual hemorrhagic type of tuberculous meningitis likewise occurs with bloodtinged liquor (XXI), occasionally, also, as we have seen above, severe Heine-Medin cases. Finally, spontaneous and posttraumatic pachymeningitis with bloody liquor should be remembered, and a similar finding in cranial, cerebral or spinal injury after trauma.

Yet, though these various conditions may show up with a sanguineous tinge, or, indeed, much blood, in the punctate, this, on the other hand, may prove entirely clear. Other clinicopathological discrepancies also occur. Thus, in Bungart's scarlet cases (53), which on trephining, showed severe encephalitic softening, the pressure had been 300, fluid clear, albumin increased, no pleocytosis. In a case of Stadelmann's (54), the liquor had been bloody and under high pressure, the same being found in three repeated punctures. The diagnosis was either meningeal or ventricular hemorrhage. Necropsy, however, revealed not a hemorrhage, but an encephalitic softening. In a group of anthrax cases reported by House (55), several showed brain complications. In two, anthrax had not been suspected until after death. The spinal fluid was bloody. In these cases, there was a meningoencephalitis, with edematous destruction of the tissue—and the finding of the anthrax bacillus in the lesion. In Lambert's case of poisoning by hydrocyanic gas (56), the spinal fluid had been under normal pressure, gave a cell count of 207, 45% of which were polymorphonuclear. This (and the symptoms) suggested purulent meningitis. Necropsy revealed only an encephalitis, with evidence of small hemorrhages in the white areas, and neuronophagia changes.—In rupture of a cerebral aneurysm (or occasionally an artery), the liquor is nearly always bloody. This usually occurs only after an injury or strain.

In this entire series of cases, we can see how diagnostically misleading the spinal fluid may prove—how little differentiating help it may afford us. There are still several other conditions come upon—often intimating an encephalitis where this does not exist, and which should be remembered, for here, too, the spinal fluid gives no diagnostic aid. Thus, in many cases of botulism, the liquor shows nothing, and necropsy reveals nothing abnormal in the brain. It has been suggested that in some of these cases, the toxemia has been so intense and fulminating that death occurs before brain changes have had time to develop. The negative brain findings—even in animal experimentation—have prompted the surmise that the lesion produced by botulinus toxin is on the peripheral nerve terminals (57, 58). Insulation is another such condition. There may be excess of cerebral fluid here, though it seems likely that inflammation (or hemorrhages?) may also occur (XXII). In pertussis, one likewise sees pictures which at times intimate hemorrhage, or, encephalitis, yet in which nothing but serous meningitis is found. The brain itself may show a serous saturation. Thus, a case of Finkelstein's (60) is of considerable interest. This belongs to the chapter of meningitis serosa—but is given here because of its great resemblance to cerebral hemorrhage as one sees it in pertussis, or to encephalitis:

Case V.—E. F., one year old. Following an intense paroxysm on January 26th, severe convulsions. High temperature, coughing, vomiting, bronchitis; February 8th, irritability, somnolence, transient strabismus, jerking in the extremities, together with increased bronchitis. On the tenth, the temperature rises to 40.5°-41° as convulsions set in, repeated many times, also in following days. Between these attacks, sopor of changing intensity. Rightsided abducens paresis, strabismus, unequal pupils, stiffness of the neck, automatic movements, spasms and paresis of extremities, considerably severer on the left side. March 5th, severe convulsion, with exitus. Necropsy: mild ependymitis of the lateral and fourth ventricles and slight hydrocephalus internus. Bronchitis. Brain, itself, negative.

In contrast to the condition of serous saturation, one must bear in mind the cases of brain swelling, a swelling of the brain parenchyma itself (Reichardt). In these cases, the brain becomes larger than the skull capacity. Very little liquor, indeed, may be present. The brain here is dry.

Apelt (61) found the condition by no means infrequent (in infectious diseases, uremia, typhoid sepsis, pseudotumor, etc.). It might come on with great rapidity. In a case of Apelt's, the patient, while eating, suddenly fell to one side and died. The skull capacity was found seven tenths per cent. smaller instead of ten per cent. larger (as is usual).

In connection with brain edema and brain swelling, we must also think of uremia and eclampsia. The symptoms in both these conditions may be identical with those found in hemorrhagic encephalitis. In fact, brain edema is often the underlying pathology (XXIII). There may be convulsions, a hemiplegia, hemianopsia, etc., and necropsy discovers nothing. In scarlet fever with kidney involvement, the onset of cerebral symptoms may portend a meningitis serosa, an encephalitis, a uremia. If there happens to be an otitis present, there may also be a serous meningitis from neighborhood irritation, an otitic associated encephalitis (Oppenheim), a brain abscess, a sinus thrombosis! Lumbar puncture brings little or no diagnostic aid. A high urea content in the blood may point to uremia. (Here uranalysis, blood chemistry and blood pressure may aid.)

In adults, a socalled pseudouremic condition, with similar brain symptoms, may be occasioned by focal softening through the closing of cerebral arteries in cases of arteriosclerosis. Such a patient frequently has a kidney involvement, in which case the exact diagnosis may become puzzling.

MENINGITIS SEROSA.

In close association with encephalitis, one must consider meningitis serosa, which often enough accompanies the former, and constantly proves a prob-

lem. It is a serous inflammatory process—reaction—in the leptomeninx (XXIV), either external (convexity and base, or in circumscribed irregular areas) or internal (intraventricular), or both, and may be called forth by the toxins of the infectious diseases, the ingested or endotoxins of gastroenteritis, the exanthemata, syphilis, autointoxication, acidosis, cerebral trichinosis, cysticercus, brain trauma (i.e., violence to skull) and by the way of socalled neighborhood irritation (Oppenheim), as in otitis (in which a meningitis sympathetica may also occur), or abscess, or as a "foreign body irritation," i. e., in pachymeningeal hematoma. Quincke even thought that in intracranial hemorrhage, the blood itself might possibly act as a foreign body, and irritate the meninges to secretion. As just stated, it not infrequently accompanies encephalitis, primary and secondary. Not long ago, the New York Health Department pointed out the possible appearance of decided meningismus in severe sore throat (65), and Göppert (66) called attention to its frequent existence in mild febrile affections of the upper respiratory tract (nose, nasopharynx, etc.). This serous oversecretion is accompanied by a migration of small lymphocytes—a few or many (XXV). In such cases, the spinal fluid shows:

Clear fluid; at times, slightly turbid (if many cells are contained).
Sometimes pressure (a little to very considerable), sometimes none.
Lymphocytes may be sparse or numerous.
Ordinarily no bacteria (sometimes, however, a few bacteria are come upon [pneumococcus, streptococcus, etc.] (XXVI).
Phase I.—opalescent—weak+; 20% fraction, negative (Kalfka).
Albumin in excess of the normal.
Hemolysis, negative.
Sugar reduction often.

Thus, one can see how the liquor findings here may be similar, or even identical, with that of poliomyelitis, epidemic encephalitis, tuberculous meningitis (where the t. b. c. is not found), or even syphilis (cf. Gennerich on metalues). Diagnostically, a difficulty also arises, inasmuch as meningitis serosa not only often accompanies encephalitis, but frequently occurs in the very diseases (the infections) in which we also find, or may expect, an encephalitis. The studies of Herrick and Dannenberg (68) showed that a serous meningitis may be present and severe, with little or no clinical evidence, and, again, be mild in the face of decided clinical manifestations. It may be severe in cases where one would least expect it (tonsillitis, mumps). The liquor may at times be under considerable pressure; the lymphocytes (rarely polymorphonuclear) be numerous—far more so than hitherto suspected, well above a hundred, in one case up to 200 (XXVII). However, cell counts above a hundred will usually make us think of Heine-Medin disease or syphilis. (It must not be thought, though, that the liquor of these two diseases always has a high cell content; occasionally this is quite low).

The symptoms of serous meningitis are chiefly those of pressure—headache, vomiting, retraction of neck—sometimes evidencing great fluctuations (this helping in the diagnosis. (Cf. Finkelstein's case, above). Often pressure develops slowly; yet it may come abruptly (apoplexia serosa). In the intraventricular type, the rapid effusion (acute hydrocephalus) may suddenly prove serious. The consequent convulsions which set in may be prolonged and sinister (XXVIII). The symptoms of brain pressure are usually mingled with those of the primary disease. In the gastrointestinal cases, this disorder may be intense, and the temperature high. In very young children, in fact, intestinal disorder and temperature are frequent. In infants, laryngospasm may be associated. Indeed, spasmophilia (and rickets), with its over reactionability, must always be borne in mind when appraising the brain symptom complex in children—i. e., the infection need not be over virulent, but the reaction of the patient's nervous system may be abnormally severe. Attacks may even end fatally in such a (spasmophilic) child, and nothing of encephalitis or meningitis be found. Where either of the latter, however, does occur, the effects are decidedly stormy.

In the early days, the first three or four, the differentiation from encephalitis can scarcely be made, the liquor in encephalitis showing nothing characteristic. In the encephalitis cases in which coma and convulsions continue, the differential diagnosis remains impossible. In other cases, however, *paralyses (hemiplegia, facial) will almost always be present by the third or fourth day in encephalitis, while in serous meningitis, hemiplegia and paralyses of cranial nerves rarely occur* (XXIX).

In infants, the head bones give, and, so, pressure symptoms may be avoided. In such cases, there even may be no symptoms (due to the meningitis) at all. In older children, the pressure may remain slight or become intense. Sometimes there is a fluctuation, with spells of severer pressure, which again let up. Such variability—i. e., fluctuation—will speak for meningitis serosa as against hemorrhage (XXX).

The blood shows nothing. A lymphocytosis may be present, due to the underlying condition. A high leucocyte count may point to a suppurative condition not previously suspected.

PURULENT MENINGITIS

Of the nonserous meningitides, the *epidemic form* is clinically characterized by violent headaches and pain in the nape—coming on rather suddenly, together with vomiting and vertigo. Usually there is nuchal rigidity, usually opisthotonus. Hypersusceptibility of spine, skin (tache) and muscles will be found, and, for the most part, scaphoid abdomen, Kernig, Brudzinski, sometimes Babinski, frequently labial herpes, and irregular, irreactive pupils. (Recently a new sign of meningitis has been pointed out: the auricularis sign, i. e., a hyperesthesia of the posterior wall of the external auditory meatus—without hyperesthesia of the anterior wall (70). Possibly other sources of irritation, beside the meninges, may give the sign (71). There may be an exanthema (petechial). These children have many convulsions—and cry much. On the other hand, retraction of the neck is often absent, especially in infants. In such, the disease may at times show no more than high temperature and rapid pulse. Should there be no retraction to suggest meningitis, there may be a bulging fontanelle. Again, in some infants, this is present, in some it is not. Thus, lumbar puncture must give the diagnosis, i. e., a purulent fluid, con-

aining polynuclear leucocytes, and the diplococcus ntracellularis.

There are cases in which the pus, because of a asting up of the meninges, does not get into the pinal fluid—which remains clear (cf. footnote No. XXIV), and may be under pressure. Through ulture the diplococcus may, however, be obtained rom this clear fluid (Thiemich (72). These cases, owever, cannot be frequent.

One may, in general, rubric the purulent menin-itides as follows:

Appearance: turbid, like pus, often xanthochromous.
May, or need not, be pressure.
Cell count strongly positive—usually uncountable, mostly olymorphonuclear leucocytes.
Phase I, three plus; 28 per cent. fraction, plus (Kafka).
Albumin increased.
Sugar decreased.
Hemolysin reaction, three plus, (Kafka).
Mastix and colloidal gold: meningitis curve.

Two epidemics of myositic pseudocerebrospinal neningitis have been noted (Lenhartz, Curschmann (73)), the disease being characterized by myositis of he neck musculature, with participation of the rticulations of the cervical vertebræ, clearing up promptly on aspirine.

Tuberculous meningitis is easily differentiated from the epidemic, inasmuch as it does not begin acutely: it has a characteristic prodromal stage (decided change of mood, apathy, severe anorexia, loss of weight, disturbed sleep, vomiting, etc.). Yet, occasionally there are cases in which this period is missed (Nonne, Zappert)—while, in young infants, little change need be noted.

The disease begins with headache, temperature, apathy and vomiting. The pulse, in spite of the temperature, is slow and irregular. There is nuchal rigidity and hyperesthesia. Kernig is often present, abdomen scaphoid, pupils irregular, slow in reaction, mostly contracted. Choked discs may be seen. After two weeks, the paralytic stage comes on—strabismus, ptosis, pareses of face and basal cranial nerves and extremities, etc.

The tubercle bacilli in the liquor give the diagnosis —only one does not find them so easily. There are very few in number at the beginning of the disease—must be looked for—and are found only after diligent search, often only on the second or third puncture (XXXI). Rarely, they are not discovered at all, even with animal inoculation. The fluid is usually clear or very slightly turbid, or slightly yellow (or sanguinous in the hemorrhagic type, cf. above), under pressure (high at the beginning of the disease), containing small mononuclear leucocytes. A fibre net is set off, but this no longer is found pathognomonic, as it is occasionally found in Heine-Medin disease, epidemic encephalitis and in syphilis. (Nonne [l. c. Pette] found it in a case of acute syphilitic meningitis; Gennerich in luetic meningoencephalitis; Quincke in both syphilitic meningitis and serous meningitis.)

Tuberculosis in the family or the patient, apices (x ray of lungs) bones, joint (coxitis) glands, tubercle in the choroid) will make us strongly suspect the meningitis to be tuberculous. It may also be remembered that the syphilitic infant, or child, is very prone to tuberculosis. (In Hochsinger's series, 80% of the deaths occurring in syphilitic infants after the second year, were due to tuberculosis (75).) One may suspect something also after measles and pertussis. This is preponderantly a disease of infancy and childhood—only occasionally seen in an adult.

Our liquor schema would read as follows:

Clear usually; (web after twenty-four hours; this may, however, be absent in the first or second puncture). Occasionally slightly turbid, or slightly yellow, or, rarely, hemorrhagic.
Pressure usually increased; early, may be very considerable.
Cell count mostly small lymphocytes, a few or many: sometimes leucocytes (XXXII).
Tubercle bacilli in liquor (when found).
Phase I.—weak positive.
Slight increase of albumin.
Pandy: always positive. (*Without positive Pandy, strong doubt as to condition being tuberculous.*)
Sugar *decreased.*
Mastix and colloidal gold: meningitis curve.
Blood gives a positive (rapid) corpuscles sedimentation.
Blood gives a positive Mátéfy (see below).

In the remaining purulent bacterial meningitides, the liquor will reveal, besides more or less pus, the special organism of the disease (pneumococcus, diplobacillus pneumoniæ, Friedlander, Pfeiffer, staphylococcus and streptococcus, colon bacillus, occasionally the lactic aerogenes, rarely the pyocyaneus, bacillus dysenteriæ, very rarely the Gaertner (77), typhoid, the paratyphus-B, the gonococcus, yeast infection [Türk, cited by Lenhartz (78)], the streptothrix (79), micrococcus tetragenes, and proteus). The disease in these cases being usually secondary, the primary condition may serve as index of the possible or certain source (wound of skull or scalp, otitis, sinusitis, ethmoid, sphenoid or nasal ulceration, abscess of tonsil, occasionally retropharyngeal abscess (XXXIII), or foci of suppuration elsewhere (pyemia, typhoid (XXXIV), pneumonia, bronchiectasis, abscess of lung, pyelitis, foci of bone suppuration, pyodermia, erysipelas, etc.]). A meningitis sympathetica has been described (l. c. 76), a condition due to neighborhood irritation, especially seen where otitic abscess is the source of irritation, clinically giving a picture of meningitis; the spinal fluid showing pressure and containing polymorphonuclear leucocytes, increased albumin, but no bacteria —i. e., asceptic purulent meningitis. The fluid is turbid from the content of pus cells. Occasionally, however, here, as in other purulent liquors, the appearance may be clear. The resemblance to meningitis serosa due to neighborhood irritation is evident —save that in the latter, no polymorphonuclear leucocytes are usually found in the spinal fluid. In the cases reported, the prognosis was serious.

Yet the diagnosis of meningitis sympathetica should be made with great reserve. Just as in tuberculous meningitis, bacteria may here be found on the second or third puncture—or even later search. Animal inoculation should also be made. (Nor ought a few bacteria to influence the diagnosis, if such a purulent reaction can be called forth by neighborhood irritation. It may be remembered that a few bacteria are likewise often found in serous meningitis [l. c. above].) But it appears that even in serous meningitis, numerous polymorphonuclears may at times be found, judging from the case reported by Kilduffe (82). Interesting is the fact that

polynuclears may be present in abundance in the liquor of a case (cf. Lambert's) in which an intense encephalitis obtains, and no meningitis at all. There are also cases of poliomyelitis, we should remember, in which polynuclear leucocytes are found in the liquor— and no bacteria! Ayer (83) found them frequently, and in considerable numbers, in the first twenty-four hours. In the cerebral form of the disease (Heine-Medin encephalitis), Koplik (84) saw a case which strongly resembled tuberculous meningitis. Even the von Pirquet showed a 2 mm. positive reaction. Spinal fluid contained no bacteria, and on the second puncture, seventy-two per cent. lymphocytes, with twenty-eight per cent. polynuclears, albumin 1 mm., slight sugar reduction. Finally, in the report of the Department of Health of New York City on the poliomyelitis epidemic of 1916 (l. c.), polynuclears predominated (over fifty per cent.) in thirty-nine out of fifteen hundred spinal fluids examined. However, a polynuclear liquor free of bacteria, especially in the absence of etiological or clinical clues, will make us think of a sympathetic meningitis, and search for a cause of meningeal irritation, especially abscess, or ethmoid or sphenoid disease (85). (Aseptic purulent meningitis has also been described in ptomaine poisoning, diphtheria, parotitis, uremia, eclampsia, syphilis, and after spinal injection of serum.)

Difficulties in differential diagnosis between Heine-Medin disease and epidemic, and especially tuberculous, meningitis arise. The second may at times look very much like the first (cf. Koplik's series (84)) (XXXV), though this is extremely unusual. With the tuberculous form, if the organism is not found, the temporary quandary may prove embarrassing. If paralysis appears at once, especially flaccid signs in the limbs, Heine-Medin may be diagnosed. Here paralyses almost always come early; in tuberculous meningitis, they usually come late. The decreased liquor sugar of the latter disease may give a slight clue, as well as the variance of the mastix curve. The tuberculin reaction does not seem conclusive (cf. Koplik's Heine-Medin case in which it was present). A choked disc will speak for tuberculosis—but it only manifests itself late. The most constantly positive and earliest sign noted by Rominger (86), out of Noeggerath's clinic, was the Pandy reaction. In the cases giving a negative Pandy (grippe with serous meningitis, spasmophilia, dyspepsia, encephalitis acuta, double pneumonia with brain edema following pertussis in a tuberculous family!), no tuberculous meningitis developed. This test seems very sensitive and apparently reliable. As to the action of the Pandy test in Heine-Medin disease, I have no data. Finally, the corpuscles sinking time (or sedimentation test), brought out by Fahraeus (87), may help decidedly in the diagnosis of tuberculosis. The sedimentation rapidity for the normal, in a 1 cm. tube, was found to be 3 mm. per hour for men, and 5 mm. for women (88). More rapid sedimentation spoke for tuberculosis, while normal values spoke against it. In doubtful readings, 0.03 to 0.1 of old tuberculine was injected into the patient—and it was found that, if normal, the sedimentation time remained the same, but if tuberculosis obtained, this procedure hastened the sedimentation. In children, it appears merely a Pirquet or Moro need be made for the test. Dehoff (89), who suggested this last measure, speaks very highly of it. Freud and Henschke (90), on the other hand, did not think a normal sedimentation time excluded active tuberculosis with certainty. They give the sinking time as six and one half hours for men, and four and one half hours for women. For the technic, see this sulphate last article.

A much simplified method of the above appears to be given in Mátéfy's globulin test of the blood serum (91). (One half per cent. solution of aluminium sulphate. [freshly prepared] added to 1 to 0.2 c. c. of serum. Shake. To stand at room temperature for one and one half hours.) Normal sera show a more or less strong turbidity, but no flocking. In the abnormal sera, there is a thick sediment of globulin. The greater the intensity of the disease, the more rapid the flocking process (92). The test is not pathognomonic of tuberculosis; it also occurs in syphilis, carcinoma, nephritis. This test, like the above, is distinctly valuable in prognosis and gauging the efficacy of various treatments.

That tuberculous meningitis may at times resemble epidemic encephalitis has also been pointed out (93). (Below, we also mention the resemblance of acute syphilitic meningitis to the tuberculous form.)

Differentiation between typhoid and tuberculous meningitis may come up, especially early, before the Widal is positive. The Diazo test may help to point to typhoid; the Pandy, if present—and present early enough—to tuberculous meningitis.

Uremia may look like tuberculous meningitis (urine findings). But one will also think of a tuberculous nephritis, with terminal meningitis. In a case seen by Zappert (94), a picture resembling tuberculous meningitis was present—with a dark or reddish urine. This proved to be a case of hemorrhagic nephritis—with no meningitis at all, though meningitislike symptoms had been given. In another case on record (95) with meningitic symptoms, the lumbar puncture did not evidence tubercle bacilli, but a high percentage of albumin and urea. Urine and eyes were negative. Two weeks later, convulsions came on, with renewed symptoms, the liquor now showing urea 3.45, and chloride 7.4 per thousand. Exitus. Necropsy showed a tuberculous pyelonephritis, and no meningitis.

(*To be concluded*)

Röntgenotherapy of Peritoneal and Genital Tuberculosis.—Wolfgang Uter (*Zentralblatt für Gynakologie,* July 5, 1924) believes that röntgenotherapy is the best form of local and general treatment for peritoneal and genital tuberculosis, as it has no mortality, produces no fistulæ and maintains the genital function. The proper dose is at first one eighth to one twelfth and later one twenty-fourth to one forty-eighth of the skin unit dose, including four to six exposures from the umbilicus to the symphysis pubis and without protective covering. Exploratory laparotomy may be necessary on account of the difficulties of diagnosis, but only caseous salpingitides should be operated upon. With lesser and moderate adnexal tumors, as well with peritoneal and more general involvement, the abdomen is closed and subsequently only irradiation is indicated.

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Therapeutic Possibilities of Small Doses of X Rays

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With the growing interest in biophysics in medicine, even among conservative physicians, it is perhaps timely to speculate in the fields of physiology and pathology in terms of the electron theory. Indeed, to understand the behavior of living cells in health and disease the physical factors must be considered for they are primary and basic. The literature in this field has grown enormously of late and is enlightening. It is the belief of many that our greatest advances in diagnosis and in therapeutic measures are coming out of the physics laboratories. The part played by colloids in the physicochemistry of cell structure and function is most interesting and important. In this connection I quote R. S. Lillie (1924), who says, "It is most important to note that in the inorganic systems (battery or electrolytic cell) in which the passage of a current induces chemical change the reaction occurs only on the surface of contact between the electrolyte solution and the electrode, not in the interior of the metallic or of the electrolytic phase. Electrochemical reactions are surface reactions. This general fact is to be correlated with the general physiological observation that the critical or initiatory changes in stimulation originate at the surface of the irritable element, i.e., at the boundary between the cell or cell structure and the surrounding medium. Surface reactions are those concerned in the initiation of stimulation and apparently also in its spread. A brief résumé of the chief facts indicating this relationship of surface changes to stimulation may now be added.

"An especially significant fact is the sensitivity of many cells to slight mechanical contact; this is seen in a great variety of organisms, and indicates that the physical effect releasing the propagated disturbance need affect directly only the cell surface. Blood corpuscles and other cells frequently break down on the contact of capillary needles; contact sensitivity of all kinds illustrates the same condition. Chemical stimulation and chemical alteration of irritability (anesthesia, sensitization) appear also to be surface effects without evidence of penetration into the cell interior; examples are the stimulation and sensitization of muscle and nerve by isotonic salt solutions (calcium precipitants, etc.), anesthetization by magnesium salts and isotonic sugar solution; increase of oxygen consumption in sea urchin eggs by nonpenetrating alkalies (sodium and potassium hydroxide). In the case of electrical stimulation the quantitative determinations of Nernst, Lapicque, Lucas and others, showing the parallelism between the stimulating action of the current and its polarizing action, also indicate that stimulation originates at the polarizable surfaces of the cell, i. e., the semipermeable boundary layers of membranes. That this is the case is also indicated by many characteristic structural conditions in the nervous system of higher animals and in other regions where stimuli are transmitted from one cell or irritable element to another. Nerve end plates spread over the surface of the muscle cell, effecting intimate contact but not penetrating; nerve cells in the central nervous system are related to one another by means of end feet, interlacing terminals, or similar structures which establish contact without penetration or protoplasmic fusion. From these various facts we must conclude that in irritable cells the plasma membrane is not merely a protective layer, but plays the part of a sensitive intermediary between the external world and the internal protoplasm.

"The indications are that any slight local physical change at the cell surface, causing stimulation of the cell, does so by altering the electrical conditions at that area, thus initiating an electrically transmitted disturbance. This view implies that all forms of stimulation are electrical; i.e., the primary stimulating agent produces its effect by changing locally the electrical potential at the cell surface."

Burns and Alexander point out the enormity of the increase in effective surface that takes place when a cube whose length of edge is one cm., is divided into cubes or particles of colloidal size (total surface of one cubic cm.=0.93 sq. in.; same bulk in colloidal particles, total surface 1 $\mu\mu$=1.48 acres).

The living organism may be looked upon as a stupendous mesh work of semipermeable membranes, enclosing protoplasm in cellular dimensions, integrated into physiological gradients and systems of organic structure to meet the needs of the individual or the species in his battle with his environment.

Chemically protoplasm may be considered a watery solution of colloids and crystalloids. It has been demonstrated that colloids, as a rule, carry an electric charge, some positive, some negative, the sign depending on the nature of the colloid and on the nature of the medium in which it is. The particles in colloidal solution are supposed to be vibrating with the same frequency as light of a certain wave length and will receive energy from that light which will tend to increase their amplitude of vibration.

Only that light, or radiation, which is absorbed is chemically active. Since absorption is apparently due to resonance in electron oscillations with the incident radiation frequencies, we can or should be able, within limits, to vary our wave lengths and frequencies, by rearranging our factors to meet any level in the body in x ray doses that may be indicated.

A word about the physics of the cell. The nucleus is electropositive and acid; the cytoplasm electronegative and alkaline, and these are in dynamic equilibrium separated by a semipermeable membrane. When static equilibrium is brought about the cell is dead. When the cytoplasm has been depleted of electrons the affinity for oxygen is lessened, a condition of suboxidation ensues, the cell approaches a positive charge and an acidosis follows with the probable formation of lactic acid and hydrations. All normal syntheses of the cell are condensations with dehydration. Pathological tissue is positive in charge except perhaps in conditions of pathological inhibition.

Professor Albert P. Mathews (*General Cytology*, 1924) is so closely in line with the substance of some of my earlier papers that I am quoting him freely.

"How then can energy, i.e., electric current times magnetic flux, be transferred from one molecule to another? It may be transferred in a variety of ways.

"1. It may be transferred by radiation in a series of pulses. Each radiant pulse contains a certain amount of magnetic flux and electric quantity. It contains 6.55×10^{-27} ergs seconds. If some of this magnetic flux and electric quantity is absorbed, this quantity per second is called absorbed energy. Thus the atoms of matter in the sun radiate from themselves these pulses as the solar atoms die. Some of these pulses being absorbed raise the store of energy in the molecules about us. In particular they raise the energy of the oxygen of carbon dioxide to form the energy-rich atoms of oxygen in oxygen molecules. These latter are the springs from which later we obtain all our energy. The electric and magnetic flux of the etherial pulses sent from the sun are caught by the molecules of carbon dioxide, not directly but indirectly through the agency of chlorophyll and stored in the unstable reservoirs of the oxygen molecule. Actually the potential energy of the oxygen molecule is raised by the passing of certain electrons in the molecule to a position farther removed from the central positive nucleus of the atom, or to a position of greater instability. According to Bohr one or more of the electrons move outward so that they are in orbits of larger radii, having a greater energy. Formaldehyde is also coincidently formed, and the carbon atom in it probably has somewhat more energy than the carbon in carbon dioxide. The formaldehyde thus formed absorbs light energy in its turn (wave length 250 $\mu\mu$), and is transformed into a more reactive kind which condenses at once to carbohydrates, and in the presence of nitrates makes formhydroxamic acid, amino acids, and other compounds.

"The chlorophyll in the foregoing instance acts the part of a catalytic agent, that is, it acts the part of a conductor of energy from the light pulse to the molecule of carbonic acid. All catalytic agents act probably as conductors of energy. Chlorophyll is a photocatalytic agent, that is, it conducts the energy of light to another subsance, carbonic acid.

"2. But the energy may be transferred not by that form of electric quantity times magnetic flux known as light, as a series of pulses in the ether; it may be transferred in that form known as an electron. We have not yet discovered a method of transforming these two kinds of energy seconds, namely, an ether pulse and an electron, one into the other. Perhaps it cannot be done, although they are essentially the same in nature. But we know that molecules or atoms may part with their energy in either one of these two ways, either by radiating another pulse, that is, radiant, reversible energy time, or by discharging an electron, a quantity of irreversible energy time. For this electron, or permanent ether pulse, to be shot out from the atom a considerable quantity of energy time must usually be absorbed. The electron usually leaves at a rather high, indeed at times a very high, velocity. The velocity with which the electron is radiated depends upon the amount of energy absorbed, that is, it depends upon the energy content of the ether pulse which is absorbed. For since, in all ether pulses the total product of energy time is a constant, some pulses will have a great energy content and little time; others will have a small energy content and a large amount of time; that is, in the one case the energy content is high but the period of duration is short; whereas in the other the energy content is low but the period is long. The velocity of expulsion of an electron is then dependent upon the energy content of the pulse which expels it. So the very short waves of great energy content of the period corresponding to x rays cause the expulsion of electrons with a very high velocity; while the feeble rays of the red spectrum expel them at a very low velocity. All of this is of importance in understanding color vision. It is well known that the shorter waves, with the greater energy content, those in the violet and ultraviolet, produce very intense chemical changes. Thus, for example, the energy of the silver atom is so greatly reduced by exposure to ultraviolet light that it is no longer toxic or poisonous. It becomes the inert metallic silver. By the action of light an electron is transferred from another atom to the silver atom leading to a far more stable arrangement of the electrons of the silver. The radiations of electrons under the influence of light are beta radiations. They come from certain atoms under certain conditions. Negative electrons may be given off from almost every form of matter. And their absorption may either raise or indirectly lower the store of energy in that atom or molecule which has absorbed.

"The action of x rays is generally attributed to their powers of producing a radiation of electrons at a high velocity from certain atoms of the tissues through which the x ray passes. An x ray thus has

a double effect, namely, a direct effect upon the atom which has lost the electron and also an indirect effect due to the electrons which have been shot out of one atom changing the state of another which picks it up. As the electron is not radiated in the direct line of the x ray, a scattering of electrons is thus produced which increases the radius of the area affected by the x ray. Inasmuch as the velocity of the expelled rays depends upon the energy content of the x rays absorbed, and this is higher the shorter the wavelength, or, as is generally stated, the harder the ray, so the shorter, harder more penetrating x rays produce an electronic discharge at a higher velocity than do the softer. The secondary radiations thus produced as they have a higher velocity will radiate farther before absorption. So the harder the ray, the greater will be the cross sectional area as well as the death of the tissue affected by the ray.

"Inasmuch as the more reactive tissues have their molecules in the least stable form, these tissues will be the easiest to affect by x rays. Thus, dividing cells in which the metabolism is very intense, as Lyon showed, are very easily destroyed and cancer tissue also. But there will be a boundary area in any x ray irradiation in which the anakinetomeric molecules will be increased. If this boundary is cancerous the ray here may increase cancerous growth.

"3. But the third, more common, and easier way to transfer energy is by means of conductors of electricity. To set up a pulse in the ether requires either a great deal of energy action for a short time, or a small amount acting for a long time. The value of h, the minimum amount of energy times time which must be accumulated before radiation can occur, is 6.55×10^{-27} ergs seconds. Similarly to discharge electrons by radiation requires a considerable increase in energy, in many cases at least. Between substances, however, at a slight difference of level, or potential, of energy an exchange may take place if only they are connected by what is called a conductor. If two charged plates of a condenser at a different potential are connected by a metal, the electric potential is equalized. The metal acts the part of a path interposing little resistance to the flow of electrons along it. For such an exchange to occur, energy must be at a difference of potential.

"Now imagine the condenser plates reduced to the size of two molecules each of which contains free energy but at a different potential. If only we could connect these two molecules by a conductor, energy would pass from one to the other. Such conductors exist. We call them catalytic substances. Or the energy may pass directly, the substances uniting in a conduction union with each other. In either case, for such an interchange of energy between molecules to occur the union must be of a conducting nature. The two molecules must make such a union as to permit electrical charges to flow from one substance where they are at a higher potential to another molecule or atom where they are at a lower. In all ordinary exchanges of energy in chemical reactions of every kind, it is necessary hence for the two molecules or atoms so to unite as to make good conductors of electricity. If the molecules cannot themselves so unite it is necessary that each unite with a third, which thus is interposed between them as a conducting system. In all such cases as these the potential energy of the system is due to an electron placed in a certain position. By transferring that electron to another system the one system loses potential energy, the other gains it. It is because electrons have to be transferred in this method of carrying energy that the transferrer must be a conductor of electricity."

If we indulge further in speculation which I believe we may with propriety, and look upon some, at least, of the pathogenic organisms, in their behavior, as foreign cell nuclei devoid of cytoplasm, we should expect them to indulge in their cytoplasmic activities at the expense of the normal cytoplasm of the cells of the fluids and tissues of the body. We should expect to find them active locally, generally, and possibly selectively robbing cytoplasm of electrons, lowering alkalinity leading possibly to acidosis, the formation of lactic acid, hydration, suboxidation and venous stasis. Such is the sequence and condition in some types of pathology at least.

By small doses of x rays I mean radiation of such wave length and frequency as will be absorbed by resonant electrons in the tissues, not materially disturbing those relatively stable electrons in normal tissues, yet at the same time striving to reestablish stable groupings in the atomic structure of pathological tissues, in other words accomplishing reversibility in reversible pathological cells. The irreversible cells are probably beyond our reach. Pathological cells are peculiarly sensitive to irradiations, and cells undergoing mitosis are conspicuously so. It is for this reason that small doses of x rays at short intervals are more effective than heavier doses at long intervals. Cumulative effects in such doses are highly improbable. In the bacteriological laboratory spores resist heat that kills more sensitive bacterial forms hence fractional sterilization for destruction, the antithesis of fractional radiation for reconstruction. This latter procedure is gaining many followers even in the treatment of malignancy.

When recovery takes place the tissues are soft, the cosmetic effects are good and the field lacks the fibrosis that goes with the destructive effects of heavy doses of x rays. The entire mechanism is different. This is demonstrable in the clearing up of suitable cases of socalled skin cancer of the face. In the problem of malignancy, Crile believes that the most dependable diagnostic procedure is the galvanometric investigation of the electrical potential of the tumor and Butts goes farther contending that in malignancy the potential is high and electropositive and he treats these cases with repeated small doses of x rays. W. L. Clark in suitable cases, employs small doses of x rays at short intervals, sometimes twice a day. While C. H. Mayo seems inclined to favor the bacterial factor in malignancy he takes into consideration the subatomic pathology as well.

In employing small doses of x rays for therapeutic purposes we are dealing with energy that is effective in the field of the subatomic structure of the tissue cells and in order skillfully and successfully to use this energy clinically we should study pathological conditions at a subatomic level as far as possible. To stress this point is the object of this paper.

That ultraviolet radiations may act upon pathological conditions indirectly has been shown by Rollier, who by exposing the feet and legs to an Alpine sun has noted improvement in lesions about the head.

Some twenty odd years ago while I was irradiating lymphadenomatous masses in the groins a recession was noted in similar untreated axillary growths.

It is important that every effective accepted procedure be practised clinically if indicated and I cannot stress too strongly colloidal medication, in suitable cases, for example, colloidal calcium and colloidal iodine intravenously. Calcium has been shown to have a regulatory action on the permeability of semipermeable membranes, raising the threshold and the potential in cell activities. Disturbances in calcium metabolism should be given careful consideration in many pathological conditions.

Professor Guido Holzknecht of Vienna bluntly states that almost all the beliefs and methods of the last ten years in radiotherapy have been proved incorrect. He believes in small doses of x rays frequently repeated in order to reach cells undergoing mitosis when they are particularly sensitive to radiations. He cites the experimental work on cancer in mice where single treatments resulted in no cures, while scattered applications secured cures in two out of three cases.

That the therapeutic possibilities of small doses of x rays are being recognized is shown by the voluminous literature of today covering practically all fields of medicine. While this procedure is not a cureall, it acts benignly in many conditions formerly beyond help, or sluggishly responsive to other methods of treatment.

In some pathological conditions the treatment is made more effective by the preliminary application of sedative conversive heat and the static condenser discharge, in other cases, utraviolet light is a helpful adjuvant to ionizing doses of x ray.

A few cases only will be cited to illustrate some responsive types and the technic employed.

HYPERTENSION

Case I.—Mrs. J. W. M., aged eighty; hypertension without demonstrable vascular changes. Systolic blood pressure 260, diastolic 90, pulse pressure 160, pulse 68. Technic: Nonmechanically rectified x ray machine, radiator type Coolidge tube. Fields of irradiation—centring on pituitary from four directions including thyroid, parathyroids, pineal, possibly thymus. Factors: 8 ma.; 50-60 K. V.; distance 24 inches; time 30 seconds each field; filtration 3 mm. of aluminum. The blood pressure fell quite abruptly; continued satisfactory after twenty treatments three times a week. June, 1922, systolic pressure 152; diastolic 65; pulse pressure 87; pulse 72. Abroad seven months without treatment. January 16, 1923, before treatment systolic pressure 156. November 25, 1924, systolic pressure 140; diastolic 70, pulse pressure 70. No other treatment except mild sedative autocondensation during autumn, 1924.

Case II.—Miss C. D. F., aged thirty-eight; hypertension following influenza in France, 1918. She had been gone over thoroughly elsewhere. Her tonsils had been removed. No appreciable impression had been made on blood pressure by any previous treatment. There was a probable endocrine disturbance. The patient was first seen on February 9, 1925. Blood pressure 232 systolic, 150 diastolic; pulse pressure 82, pulse rate 76. Arteries were soft. Ten treatments were given on consecutive days in series of five at a time; same technic as in Case I. Before the last treatment on March 16, 1925, the systolic pressure was 176, diastolic 100, pulse pressure 76. The patient is still under observation. Autocondensation acted unfavorably in this case. Treatment by x rays only.

TINNITUS

Case III.—Mrs. J. W. S., aged seventy-eight; tinnitus of five years' duration. Treatment was begun on March 9, 1923, using same technic as in Case II. Tinnitus disappeared after third treatment, with no return to date. X rays only were used.

Case IV.—H. L. W., aged sixty-one, duration of tinnitus twenty years off and on. Treatment on October 26, 1923, using same technic as in Case III. Tinnitus disappeared after second treatment; no return to date. X rays only were used.

OTOSCLEROSIS

Case V.—D. H., female, aged twenty; seen on November 2, 1922. She had been referred by a local competent aurist; diagnosis, otosclerosis. Same technic was used in treatment. A careful and conservative checkup was made by the aurist who reported at least twenty-five per cent. improvement. Patient is still under observation, and doing well. X rays only were used.

CHRONIC SUPPURATIVE OTITIS MEDIA

Case VI.—J. M., aged fourteen; seen on February 2, 1921. Both drums showed large perforations; there had been persistent suppuration in both ears for twelve years. He had been unable to attend school for the past three or four years on account of deafness. Same technic was used as in the other cases; suppuration ceased after the first week; no return. Reentered school within a month after beginning the treatment. Graduates from high school this spring (1925). X rays only were used.

CHRONIC CATARRHAL OTITIS MEDIA

Case VII.—L. J. W., aged fifty-one; duration of condition fifteen years. Clock, right ear ten inches, left ear two and a half inches; loud whisper, right ear five feet; left ear twenty-one inches. This patient had one treatment, June 26, 1922, and returned to his home in Detroit, where his aurist, noting the improvement in hearing (clock, right ear seventeen and one half inches, left ear four inches; loud whisper, right ear six feet, left ear thirty-five inches) tried to carry out the technic there without result. Patient returned on January 19, 1923, when the improvement noted continued on August 16, 1924, the last treatment, clock, right ear twenty-one inches, left ear five inches; soft whisper, right ear twenty feet; medium whisper, left ear twenty feet. He returns from time to time with the approval of his aurist.

ACUTE ECZEMA

Case VIII.—W. O. H., aged thirty-nine, a lawyer. The condition was of a few days' duration. Both hands, fingers, dorsum and palms were involved, with the usual severe acute symptoms. Sedative ultraviolet light, air cooled lamp at forty inches, was applied two minutes each to palm and dorsum. X ray used, with same factors as noted above except the time, which was one minute palmar, and one

minute dorsal exposure. Patient went into court after first treatment; his subjective symptoms had disappeared. He had a second similar treatment only. His recovery was prompt and complete. No other treatment was given.

INFANTILE PARALYSIS

CASE IX.—G. C., aged fifteen, duration of condition twelve years, involving anterior horns extensively, also upper and lower extremities and trunk. Sedative diathermy was applied to involved cord for elevation of temperature and arterial hyperemia; static condenser discharges for contractile effects, and ionizing doses of x ray; factors: five inch back up spark, eight inch target skin distance, one millimetre aluminum filter and a five milliampere minute dose. This patient was referred by a specialist and is checked up by him from time to time. Conspicuous improvement has been noted.

The importance of proper technic is well shown in Case VII. Faulty technic may bring no results. In modifying the technic, we shorten the wave lengths and increase the frequencies by increasing the voltage. When indicated I introduce a suitable foreign body into the field of the rays and in contact with the area to be treated in order to make use of the soft secondary radiations given off in situ.

Pfahler, Clark, Snow, Cook and others have long recognized the value of small doses of roentgen rays in treatment. While using x rays in treatment in the early days I observed repeatedly indirect effects which we could not then explain. Child's metabolic gradient conception throws light on this problem.

I am offering nothing particularly new in this brief paper. Much has been left practically untouched, oxidation, for example. My aim has been to stimulate interest in cytophysics and cytochemistry in pathology so that our technic may be bettered and the possibilities and limitations of this procdure may be recognized. The old adage, "While striving to help, be sure you don't hurt," has special significance in this field of work. I have given thousands of treatments during the past five years and have seen no recognizable ill effects in any case.

25 WEST FORTY-THIRD STREET.

The author's references will appear in his reprints.

Treatment of Pneumonia by Diathermy*

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The successful employment of diathermy in the treatment of pneumonia is based upon the effects of heat produced by that current in its passage through the tissues. That the current, in its passage, produces effects upon the metabolism of the cells other than the conceded effects of heat is probable; for, there are reflex effects from the administration which are attributable to heat applied at moderate temperature. The action of heat upon all tissues is to raise the local resistance together with depressing effects upon bacteria with degrees of heat not otherwise detrimental.

Nagelschmidt (1) showed that if strong currents of this character are passed through a solution of potassium iodide, no precipitate is thrown down, demonstrating the absence of electrolytic action.

DIATHERMY

Diathermy, the bipolar method of administering the d'Arsonval current, produces the local and constitutional effects of heat; the effects depending upon the sizes of the two electrodes, the current strength of the administration, the duration and the method of application. In the treatment of pneumonia with two electrodes of equal size placed at opposing sites, the skin toleration determines a safe degree of heat for passage through the intervening parts. This is easily effected with perfect control with modern apparatus, the socalled thermal penetration producing the characteristic effects of heat.

A skin tolerance of 105° to 106° F. and more is readily borne by all of the tissues beneath the surface. In the mucous cavities 115° F. may be administered without danger or discomfort.

It is not necessary to amplify on the importance of heat as a therapeutic measure before those who have made use of it, as all physicians do in one way or another. When, however, we consider its employment by the methods under consideration, we are entering upon a larger, more important use of heat than the older methods conceived. It has been shown that local applications of moist or dry heat at the surface, employing temperatures which can be tolerated, do not penetrate beneath the skin, and that reflected radiant light and heat penetrate, at best, but a limited distance to parts beneath the surface. A field of remarkable possibilities is opened with a measure which, when intelligently employed, will produce heat through the depths of the body without risk.

The physiological effects of heat, whenever applied to normal living tissue, is to increase the flux of blood to the part, producing hyperemia relative to the degrees of heat employed. This effect is in conformity with the normal reflexes provided to protect the tissues automatically from extremes of temperature.

In conformity with this law hyperemia occurs whenever heat is induced in normal tissue. This granted, it is conceded that whenever heat passes through disengorged tissues the increased flux of blood carries to the tissues an increase in nutrition, an increase in the number of leucocytes and metabolism is accelerated; all of which contributes to increase local tissue resistance.

In addition to these effects the tissues will with-

*Read by invitation before the Medical Association of the Greater City of New York, at the New York Academy of Medicine, December 17, 1923.

stand temperatures which will impair the development, lessen the virulence or destroy, in varying degrees, the existence of bacteria that are susceptible to relatively low temperatures, as are the gonococci. The germs of erysipelas yield to prolonged applications of reflected incandescent light, and middle ear infections to the same source of radiant light and heat.

As to the temperature which may be exerted during the passage of the direct d'Arsonval current—diathermy—it will vary with the resistance of the tissues, but will compare favorably with that of the skin vascularized by the action of the current. Most patients will tolerate at the surface a temperature of from 105° to 106° F.

Sternberg states (2), and is quoted by Hiss and Zinsser, that the pneumococci grow best in cultures at a temperature of 95° to 97.7° F., cease to grow at 104° F. in solid media and at 107° F., in fluid media, and are destroyed at a temperature of 125° F.

From these observations, it is apparent that with arrest of development of the pneumococci and increase in the phagocytic activity coincident with pneumonia, those conditions should contribute to the termination of the pneumonic processes, as it does in other pulmonic infections. This now seems to be justified by clinical experience as will be shown.

The value of diathermy in bronchitis has been demonstrated by ourselves and others, both by personal experiences, in the prompt relief from acute and chronic bronchitis. In the chronic cases, prolonged courses of treatment of from one to two months have been generally successful.

I have frequently stated that the time is coming when these conditions will not exist, because earlier and better management will exclude them; for as in pleurisy, it will be true of pneumonia; if treated before consolidation with the blood still in circulation, by the induction of hyperemia with the heat of diathermy and with the local increased phagocytosis it is possible to arrest the condition in the first stage.

Dr. Byron S. Price (3), first reported the use of thermopenetration or diathermy in the treatment of pneumonia as follows:

"During the stage of engorgement, and as well that of hepatization, however extensive, thermopenetration induced by proper quality of current gives prompt relief, both subjective and objective. Further, it is an active form of treatment which extensively decreases the mortality percentage. . . .

"The immediate effects are, marked diminution in dyspnea, cough, pain or distress, cyanosis and nervous excitability. Within a few minutes a tense and rapid pulse, as in asthenic cases, becomes much softer and slower, accompanied by slower and deeper respiration and the expectoration becomes more liquid and freer. The patient usually sleeps and rests comfortably after such treatment. He always asks for it to be given frequently.

"There is produced a more active phagocytosis and higher opsonic index with consequent inhibition of germ activity. Further, the degree of heat produced in the tissues, lessens the virulence of the cocci. As a result defervescence takes place by lysis."

The government hospitals have offered the best opportunity to demonstrate these methods, because they have the necessary apparatus at hand, as we regret to say, few other hospitals have.

It fell to Dr. Harry Eaton Stewart to verify further the value of diathermy in pneumonia at the Marine Hospital on Staten Island, where he is consultant in the department of physiotherapy.

The first ten cases treated under his direction at that hospital were reported in 1922, in a paper read before the American Electrotherapeutic Association (4).

The results reported in these cases, which were carefully tabulated with full case histories, were most encouraging if not conclusive.

In a recent monograph issued by Stewart (5), more cases of his own and others are reported which further demonstrate the value of diathermy in pneumonia. In this work, Stewart has given a scientific consideration of the methods of employing diathermy in pneumonia, and other inflammatory affections. In this work, he reports thirty-four cases of lobar pneumonia treated by diathermy in his service at U. S. Marine Hospital No. 21. In these cases there were seven deaths, death occurring in cases where there was little prospect of recovery from the outset. In one, in which five lobes were involved, treatment was begun on the third day. One case was complicated with empyema, another with bronchial asthma, another, in which the patient was fifty years old, with scoliosis and Wassermann four plus, and another with extreme hypotension.

Dr. Broeser and his associates reported thirty-one cases with but one death—a patient whose condition was complicated by chronic heart and kidney disease.

Of the cases reported by Stewart and Broeser, in but one was treatment begun on the first day, two on the second day, twenty on the third, thirteen on the fourth day, seven on the fifth, seven on the sixth day, seven on the seventh day, and one on the tenth day. The maximum current employed was 2,000 ma. and no reference was made to the sizes of electrodes. The average number of treatments administered was about six.

In all, sixty-seven cases had been reported as treated with diathermy with but eight deaths. As compared with controls computed by Stewart in his own cases, those treated by diathermy gave a mortality of 19.4 per cent.; whereas, the controls gave a mortality of 42.9 per cent.

When we analyze these figures, it must be acknowledged that treatment is beneficial when instituted after the third day, and that all cases terminated, as they did, by lysis and none as pneumonia regularly terminates by crisis. It must be conceded that the altered course was due to diathermy; and, furthermore, we may expect that when treatment is instituted during the first stage, before consolidation, that the mortality will be reduced to a minimum.

TREATMENT

High frequency transformers of adequate efficiency are now made by many manufacturers and consist essentially of a closed circuit transformer to step up the voltage, which is properly placed in circuit with two condensers, a d'Arsonval coil, a spark gap, and a hot wire meter. The multiple spark gap is a crowning feature of any apparatus of this kind.

The capacity of a capable apparatus should be

such as to deliver at least 3,000 ma. as measured by the hot wire meter, and more is often desirable. Such apparatus is adapted to both the alternating and direct current. When employed with the direct current, a rotary transformer is required to change the current to alternating. This is a matter of concern in a city like New York, where both currents are installed, requiring, with a portable apparatus that may be moved from place to place to patients' homes, a portable rotary transformer that will deliver 110 volts, otherwise, unless the apparatus is made especially to operate on a lower voltage, the output will be below the standard of requirement.

The electrodes may be made for use by the physician or his aides of sizes and shapes to meet the requirements of individual cases and conditions. They are made of soft composition metal or lead of thickness 22 B. and S. gauge, a standard which I introduced many years ago for static electrodes. Metals of that thickness keep their shape and do not become as wrinkled as does thin tinfoil.

We introduced the method of turning over the edges to give a rounded surface that would not discharge current from the margins as from a sharp edge of the metal, and so irritate or burn the skin. We leave a wide margin turned over at one end, to which we secure the clamp of the connecting cords that will securely hold it in place. This is important, as otherwise a dislodged terminal might cause a severe burn. The electrodes are thoroughly moistened and placed in close contact with the skin and must be firmly secured, so the patient can in no way remove them when the current is turned on, or a severe burn may be produced. The current should then be turned on slowly, taking from five to ten minutes to acquire the maximum temperature to be employed. During this time the patient should be instructed that the temperature over the whole surface should be the same. If there occurs a stinging sensation anywhere at the margin, or beneath the electrode, that pressure will not arrest, it will indicate that it is not in proper contact possibly from the presence of some object, as clothing or dressing beneath the metal, or that it is not properly moistened. It must then be removed and readjusted. Let the patient perfectly understand this, and if for any reason the surface is anesthetic, or the patient unconscious, observe the greater care.

These matters of technic are important, but require no more than ordinary foresight and attention to details with which all who employ diathermy should be familiar.

The familiar rule of doses of 100 ma., as measured with the hot water metre, to every square inch of surface, is a safe rule, but subject to some variation in cases with weak cardia or a sclerotic arterial condition. The usual rule that we employ, where it is desirable to exert a maximum heat effect for relief of the pains of pleurisy or in the early stage of pneumonia, is skin toleration.

The treatment of pneumonia by the administration of diathermy, either as an adjunct to other methods or as the main dependence, does not contraindicate the use of any other indicated measure, only as it renders their use unnecessary. Like heat, otherwise employed, it is congenerous with most methods.

In the first stage of pneumonia, with the usual severe pleuritic pains and chills before consolidation, it should abort the condition, from the point of view that the leucocytosis increased by heat should arrest the infection, when active circulation with hyperemia is so induced. It does this in acute pleurisy and acute general bronchitis, in our experience, without exception. The increased phagocytosis with increased flow of blood with the hyperemia induced by the heat, is an important factor in this stage, and if, as demonstrated in the laboratory, a temperature as low as 104° to 107° F. will arrest the development of the bacteria even lower temperatures would retard the growth. The leucocytes then complete the destruction and arrest the affection.

The clinical picture in the cases reported by Stewart and Broeser (6) and of the case that will be reported, seem to justify this assumption.

The second stage.—When consolidation has developed, as in all the cases reported by Stewart and Broeser, the histories recorded a most remarkable improvement. Every case in which recovery took place terminated by lysis and none by crisis.

This gave marked—I might say conclusive—evidence that the process was arrested either through the influence of the increased presence of leucocytes in the field, or the arrested development of the bacteria, or both.

As previously shown by the experiments of Sternberg, the development of the pneumococci is arrested in a solid media at 104° F.; so the current passed through a consolidated tissue which offered greater resistance to the passage of the current and exerted greater heat and so unfavorably affected germ activity. Be this as it may, the clinical picture is the same without reference to type.

In the advanced second stage, when the cardia shows marked signs of weakening, and cyanosis is present, as in the case here reported, the current should only be passed through the posterior cardiac space of both lungs or obliquely through the right lung, if affected, until the heart action improves, otherwise there will be danger of increasing the cyanosis. The narrow electrodes—four and a half by seven inches—should then be used and the treatments should be for shorter periods and more frequently repeated for approximately fifteen to twenty-five minutes and repeated every four to six hours.

The following case will illustrate most of the pertinent points of technic, and the progress of a case under treatment:

Case.—Dr. H. B. K., dentist, a transient in the city, was taken suddenly ill at a hotel Sunday evening, March 18, 1923. He was seen Sunday afternoon by the house physician who pronounced it to be a case of grippe with malaise and pains in the lower back with slight cough. Monday afternoon there developed in the patient a temperature of 104° F. with pain in the side when a diagnosis of pneumonia was made by the house physician. This was on March 19th.

The temperature, pulse and respiration from the 20th to the 23rd were continuously high, the temperature ranging from 103° to 106° F., the pulse from 112 to 140, and the respirations from 35 to 60.

On the morning of March 23d, I was called on by friends of the patient and requested to assist in the

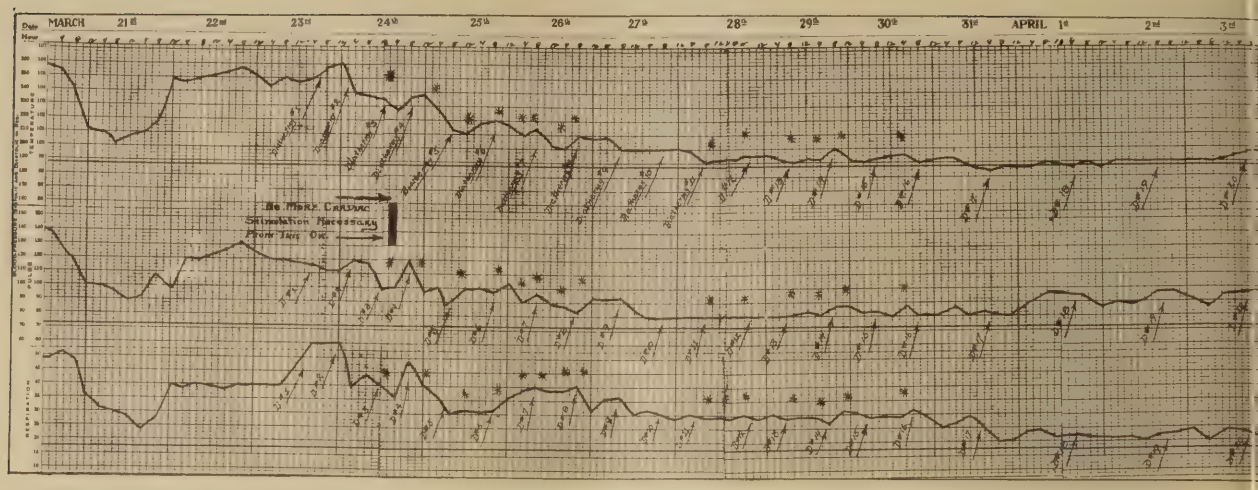

Fig. 1.—Chart of patient H. B. K., from first days of diathermy treatment to end of treatment. D, diathermy; *, Thermolite.

treatment of the case with diathermy. The patient's condition was otherwise considered to be hopeless. With the consent of the physician in charge we began the treatment. After some difficulty, we had the apparatus installed and on March 23rd the first treatment was instituted by my son whom I delegated to take charge of the case.

The patient was first seen in consultation with the hotel physician on the evening that treatment was instituted. At this time he was suffering from a case of type three pneumonia in the fifth day.

There was consolidation of the entire right lung and the lower lobe of the left lung. The patient was cyanotic, receiving inhalations of oxygen every half hour for ten minutes, and regularly digitalis and camphor in oil for stimulation. His temperature was then 104.2° F., pulse 120, and respiration 40.

The first treatment was given at 6 p. m. for twenty-five minutes, 1,500 ma. with electrodes four and a half by seven inches, laterally through the posterior cardiac space. At 8 p. m. the temperature was 105.6, pulse 112, respiration 60. At 12 p. m. the temperature was 106, pulse 112, respiration 60.

March 24th, sixth day, the treatment was administered at 4 a. m. as on the previous evening.

After treatment, temperature was 104, pulse 116, respiration 40. At 8 a. m., temperature was 104.8, pulse 116, respiration 48. At 12 m., temperature was 103.6, pulse 98, respiration 40.

Third treatment at 12 m. Same technic but prolonged to forty-five minutes. At 4 p. m., temperature was 102.6, pulse 100, respiration 36.

The patient was complaining of severe pleuritic pain, and instructions were given to get a therapeutic lamp (a Thermolite) and apply the reflected incandescent rays over the painful areas for at least one hour at a time or continuously, if necessary..

At 6 p. m. the fourth treatment was administered for forty-five minutes. At 8 p. m., temperature was 103.6, pulse 120, respiration 48. At 12 p. m., temperature was 103, pulse 98, respiration 40.

March 25th, seventh day.

At 4 a. m., temperature was 102.6, pulse 100, respiration 36. Pleuritic pains were greatly moderated and the quality of the pulse was greatly improved. Treatments from this time were given for one hour each. At 8 a. m., temperature was 101.1, pulse 90, respiration 30. At 12 m., temperature was 101, pulse 100, respiration 32. At 4 p. m., temperature was 101.4, pulse 101, respiration 30.

At 7 p. m. treatment was given anteroposteriorly through the base of the right lung for one hour. At 8 p. m., temperature was 102, pulse 98, respiration 32. At 12 p. m., temperature was 101.8, pulse 104, respiration 36.

March 26th, eighth day in bed.

At 4 a. m., temperature 101, pulse 90, respiration 40. From noon March 25th, or after the fourth treatment with diathermy, no cardiac stimulants were given. This was undoubtedly due in part to the administrations of reflected incandescent light, which has been demonstrated to produce remarkable reflex clinical effects upon the cardiac centres in pneumonia and other depressed cardiac conditions.

On March 29th at 8 a. m., the patient had fluid at both bases, which was completely dissipated by two diathermy treatments.

From this point on, the patient made an uneventful recovery, two diathermy treatments being given daily over different parts of the chest as indicated.

On April 2nd, the patient felt well, but complained of a husky voice. One diathermy treatment anteroposteriorly through the larynx cleared this up.

The patient was discharged on April 3rd. The temperature was 98.6°, pulse 80, respiration 24.

CONCLUSIONS

1. Diathermy when skillfully administered in pneumonia with due regard to existing conditions is devoid of all danger, always a synergist, and never an antagonist to other measures.

2. Heat employed as a therapeutic measure increases local tissue resistance because the normal reflexes respond with an increased influx of arterial blood into the part, increasing phagocytes and improving nutrition and local metabolism.

3. Diathermy is the only measure that will induce heat with safety and uniformity through the body between two equal surface contacts. When so applied, it renders an exceptional service in the treatment of infectious conditions, and is unlimited in its indications, except over walled in pus cavities.

4. In all acute pulmonary conditions and early phthisis, it plays an invaluable rôle, in accord with the recognized therapy of heat.

References will appear in author's reprints.

Electrotherapeutics in Urology*

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Space makes it impossible to embrace more than a few of the important points. But the following headings may be worth while to the reader. In the transition from doubt concerning the value of physical measures of treatment to a reasonable acceptance of them, certain salient elements must be recognized. Diagnosis must be valued in terms of method conceived, improved, and universally applied as in the modern cystoscopic procedures of urology; and therapeutic values must be accepted as applied to special forms of treatment in electrotherapy and other physical treatment. Perhaps the shortest method of realizing these facts is a survey of any decade in medicine along the accomplishments of diagnosis and treatment. If during the last thirty years we compare the middle decade with the first and the last, one realizes instantly what is meant. Each decade may be compared to the disadvantage of the next preceding, but to the advantages of the next succeeding ten years.

In diagnosis in urology the cystoscope is absolutely essential. In fact, if we had to discard the one or the other in any arbitrary sense, the cystoscope would be retained whereas the x ray would be rejected. No lesion having bladder symptoms should be diagnosed without a cystoscopy, and no kidney case without a catheterization of the ureters. If the prostate is involved, the lobe or lobes chiefly in trouble must be recognized and measured, and a comparison made between the vesical and the rectal protrusion. The patency of the urethra is of extreme importance and here a peculiar fact familiar to urologists is still to be recognized by electrotherapeutists. This is that a middle lobe may obstruct the urethra so that the residual urine is large and yet the urethra seems to be patent to any usual instrument. The latter is an incident dependent on the fact that the middle lobe is pushed back or to the side by the penetrating instrument as long as it is relatively small and soft. The cystoscopist judges the meaning of such a middle lobe by the effect of its obstruction on the bladder, such as trabeculation and sacculation, increase or alteration in residual urine. Infections in the upper urinary tract are very easily demonstrated and measured and are of the most inevitable importance. It is useless to treat the bladder and the prostate if the real source of the pus is in one kidney or other.

In addition to these basic axioms for the electrotherapeutist there are two others which will always lead to failure if disobeyed. These are that where pus is retained surgical evacuation must be secured, and that where obstruction exists surgical relief of it must be given. If these time honored laws are disobeyed by the electrotherapeutist, then his treatment is futile, unscientific, and unprofessional because unjust to the patient.

The urologist must recognize that like the majority of other methods of treatment, physical measures aim to produce improvement in circulation directly and fundamentally. In other words, in rather certain measure hyperemia is the outcome. As long ago as 1905, Bier (1) had shown rather well that hyperemia possesses analgesic, bactericidal, absorptive, solvent, and nutritive effects. Bier's methods resulted usually in a congestion or venastasis rather than a constructive arterial hyperemia. Hence, in large measure many of his methods have been abandoned. Electrical methods on the other hand, of which diathermy is the predominating type, cause an arterial hyperemia which immediately has the opposite effect of a venous stasis, namely, active nutritional results.

An example of the meaning of proper diagnosis in prostatic cases and the recognition of obstruction, it is worth while outlining a case which was under my care jointly with one of the electrotherapeutists. The latter did not understand the tremendous influence of the obstruction of the middle lobe, which caused an increase in the residual urine from nine ounces, measured, while the patient was in my hands for four months, to about fourteen ounces, measured, a short time after the patient was resigned to the sole care of the electrotherapeutist. It is not possible to say exactly what happened, but attempts to pass full sized catheters probably caused the middle lobe to become edematous, and thus by adding to the obstruction, increased the residual urine. Without cystoscopy, one must rely on subjective symptoms which are always the least reliable and on rectal protrusions which may be very little when compared to obstruction of the bladder neck. Obstruction is the supreme single factor, because our bladder walls were never meant to overcome obstruction, and if the obstruction is maintained the muscle hypertrophies, trabeculates, sacculates, atrophies, and finally is practically paralyzed. Long before the period of inertia is reached ascending infection of the kidney occurs through those changes in the urine which begin with decomposition of chemical type and end with decomposition of bacterial type.

Another case illustrating the inertia of electrotherapeutists is that of a gentleman with a very large prostate, much residual urine, and a septic bladder. The patient refused operation, so that only palliative measures were possible. The patient was turned over to me by one of my colleagues during his vacation. When I reached the bedside, the bladder was above the umbilicus, and the patient so septic that he was delirious. The family physician had not passed the catheter because the electrotherapeutists had forbidden it. My reply was no matter what might have been behind such a strange opinion, I would immediately pass the catheter and empty the bladder on the simple principle that where there is septic material it should be evacuated. I slowly drew off more than a quart of foul infected urine,

*Read before the Philadelphia Electrotherapeutic Society, February 4, 1925.

washed out the bladder, directed the family physician to repeat the process every eight hours, and was pleased to see the patient's delirium relieved in about thirty-six hours. There is really no excuse for so foolish a refusal to follow the simple principles of surgery.

That the urologists are beginning to realize the value of various electric methods is shown by their tendency to adopt them. This situation is one of promise and satisfaction. Those of us who are great in the science of medicine should adopt anything and everything that is good. Long treatments of twenty, thirty and forty minutes are the ones which produce the results. During the period of lowest resistance, it is probable that daily treatments are most advisable. For example, one of my friends in the insurance compensation field has found that a daily radiant light treatment in indolent cases will maintain the rate of healing very much better than every other day, although each session may be a half hour long. The physiological results are more important than metre indications, and in diathermy they are more important than thermometer indications because a thermometer cannot possibly reach wherever the current passes. Subjective sensations are important. Those which the patient feels very definitely and may complain about especially if followed by a reaction after treatment usually indicate a current so strong that it is apt to defeat its own object. Conversely, a current which the patient does not feel except to describe it as soothing is the very one which is going to do the good.

The urological lesions which are somewhat amenable to electrotherapeutic measures are comprised in the fully accepted classifications of congestions, inflammations, abscesses, benign neoplasms, malign neoplasms, and calculus, as these affect the urethra, bladder, ureters, kidneys, prostate, vasa, seminal vesicles, and testicles. It is necessary to confine much of the following data to the male subject, on the ground that the other paper of the evening by Dr. Barton Cook Hirst is concerned in the female subject.

URETHRA

Infections causing infiammation of the male urethra are exceedingly common and probably comprise a large number of cases available for study. For several years I have been studying and am still studying the results of Ballinger's sealing in method with very satisfactory results, especially when the patient is seen within twenty-four, forty-eight or seventy-two hours after the first possible sign of discharge. The earlier cases are far the most favorable. Therefore, as yet I have not studied the use of diathermy in these acute cases. Corbus (2) states that the patient should present himself within seventy-two hours of the infection, the diagnosis must be bacteriologically determined, and the first urine clear or slightly turbid. The patient is placed on the autocondensation couch. A sterile urethral electrode is lubricated and passed for three centimetres, secured against slipping and when the patient is relaxed the current is slowly turned on and increased to 110° F. and maintained at this point for forty minutes. The current is then slowly turned off. After rest, the instrument is passed for the full length of the anterior urethra and the same procedure followed. The treatment should be and usually is entirely painless. If gonococci are present the following day two more treatments are given. If they are absent during the following three days a mild hand injection is prescribed. If they are absent for one week, cure is established. This method is interesting because it begins and ends with bacteriological examination. A question arising is whether it is the thermometric heat which does the work, as much as those biochemical influences of the current which extend beyond the sphere of the thermometer and offer no means of measurement within our present knowledge. In a certain sense the method seems to be efficient only toward gonococcal acute urethritis. We need equally to apply it or an analogous method to the bacterial nongonococcal acute urethrites which are equally troublesome in many cases. I have repeated the following scientific fact (3) before this society on other occasions, and will do so again now on the ground that it is entirely too little before the minds of physicians who are not urologists.

"The organisms which cause bacterial nongonococcal acute urethritis are streptococci, staphylococci, pseudodiphtheria bacilli and Bacillus coli communis in the pyogenic lesions, Micrococcus catarrhalis in the true catarrhal inflammations, Treponema pallidum in syphilitic and Bacillus ducreyi in chancroidal, and various organisms in herpetic urethritis. Luys (4) on this subject says that the most important are the streptococcus, staphylococcus, pneumococcus, Micrococcus fullax, Micrococcus pyogenes aureus, Micrococcus cereus albus, Bacillus typhosus, Bacillus coli communis, Bacillus diphtheriæ, Bacillus tuberculosis, and various sarcinæ. A small, thin bacillus in chains and clumps is, according to Finger (5), Adrian (6), referred to by Luys (4), the common saprophyte of the prepuce and very often in the urethra in longstanding cases. Moscato (7) reports a case of urethritis accompanying every attack of intermittent fever."

In periurethritis and folliculitis diathermy again is of value either in germicidal dose producing a temperature of 110° F., or in nutritional dose augmenting the normal hyperemia of the part and thus restoring it. Where pus is retained in any of the follicles or abscesses, surgical evacuation must be practised, unless as claimed the relaxing influence of diathermy opens up the obstructed duct.

Stricture is best treated with the negative pole of the galvanic current. The smaller the stricture the less potent the current on the ground that the smaller size of the bougie against the face of such a stricture causes the current to heap up on it, and thus to become locally too strong. Thus for a size 16 French stricture five ma. of current would not be too great, but the same current for an obstruction of 6 French calibre might be too great. For so small an instrument two or three ma. are sufficient. In the past, all the difficulties and errors in the treatment of these lesions with galvanism have arisen from the fact that the positive pole, which is irritating and caustic, and not the negative pole, which is soothing and relaxing, was used. Therefore, no one should attempt to use galvanism without being in possession of a polarity indicator. Occasionally the public utilities corporation will change their polarity in the main stations during repairs, making no difference whatever in the

lighting and power service in homes and factories but making tremendous difference in electrotherapeutic work. Diathermy may be used in stricture cases but always with great caution, and preferably only after the calibre has been restored to a large diameter and then with the purpose of assisting in absorption of the congestion and infiltration around and beyond the fibrous band themselves. The reason is at once obvious. The smaller the electrodes in diathermy the greater the danger of rather sudden overheating with tremendous and penetrating caustic effect. Such an influence is the last of all desired in this class of work.

In posterior chronic urethritis with granulations, ionization is of great value and may indeed be superior to the majority of other methods. The aim is to deposit oxychloride of the metal used within and through the depths of the mucosa. If relaxation is required the negative pole is employed, whereas if stimulation is desired, the positive pole. For mild influence, the electrode is made of chemically pure zinc and for more potent influence of chemically pure copper. Accordingly, oxychloride of zinc or copper is deposited in the depth of the mucosa for approximately five tenths c.m. In raw meat, such a penetration is readily obtainable. Owing to circulatory activities, it is probably somewhat less in the living subject. A current of not over three ma. is employed for not more than five minutes. A detail which must never be omitted is that if the positive pole has been used, the polarity must be reversed so as to cause the mucosa to come away from the instrument by the relaxing influence of the negative pole, otherwise the trauma of tearing off these adhesions will commonly do more harm than the ionization did good. Owing to difficulty and delicacy. ionization should be the last modality employed until all others have been very thoroughly mastered.

The testes, vasa, and seminal vesicles are next in order for consideration. It is said that in the army hospitals having electrotherapeutic apparatus available, diathermy was so comforting to the soldiers that they usually asked for it during the various forms of orchitis. One may adopt special instruments such as that of Corbus, consisting of a scissor-like handle of fibre carrying two oval cups for grasping the testicle. I have preferred a less direct and somewhat safer method of passing the current. A large distributing electrode is under the buttocks while the testicle is covered with a mass of wire mesh thoroughly soaped, and held in place with a light sandbag in the hand of the patient. The testicle is kept from slipping either by the aid of a Bellevue bridge or that which works equally well, the thighs of the patient closely crossed so that the gland rests between them. Corbus recommends turning the current slowly on until cutaneous discomfort is noticed and then slowly off until this discomfort disappears. I prefer much milder current, hardly over 300 ma. maintained for a long period of time, hardly less than three quarters of an hour. In one or two cases disturbance has followed a current of 750 ma. whose heat the patient noticed but did not complain about. Correlated with diathermy in these cases should be radiant light and the high vacuum glass electrode attached to the negative pole of the high speed multiple plate static machine or to the Oudin terminal of the high frequency machine. The condenser discharge glass electrode may be used in much the same way as a means of sparking the skin as a counterirritant. Finally the brush discharge attached to the negative pole of the static machine or the de Kraft brush discharge attached to the high-frequency machine may be tried within tolerance of the skin also as a counterirritant. In funiculitis all the foregoing methods may be employed, usually almost with wonderful benefit. Diathermy may be employed by using a relatively small band of soft metal along the course of the vas attached to one pole while the distributing electrode is under the buttocks. In this way the current will be heaped up within the inguinal canal for localizing the benefit, but caution must be exercised not to provoke a burn along the canal.

The seminal vesicles carry us into the interior of the body, and they add to the complexity of our problem through the determination of retention or drainage of pus. The author feels that none of this work should be undertaken except after a complete diagnosis by a urologist, because even that is by no means infallible but it is far less fallible than old-fashioned guesswork. In these cases the seven glass test of the author is par excellence the best single procedure. When in doubt, it is far better to leave any case alone so far as energetic localized treatment is concerned with any method whatsoever. Rest in bed with the ice cap if well borne, hot sitting baths, and radiant light comprise the best management, and hardly, if ever, may be held indirectly responsible for extension of the disease to the opposite side and to one or both testicles.

My reasons for caution are illustrated by the following two cases. During a vacation I referred to one of our best electrotherapeutists, a man who had a chronic discharging abscess of the prostate and declining bilateral seminal vesiculitis. One testicle had already been removed through damage to it earlier in the disease. The gonococcus was not discoverable even after a cautious seven glass test. Written requests were disregarded to the effect that the mildest possible treatment be given and that if the static wave current be used at all the gap be maintained at less than a half inch. Instead of this a three inch gap was used, and discomfort beginning during the treatment rapidly augmented and finally appeared as involvement of the other testicle which had to be removed, according to the judgment of the general surgeon who had charge of the case after he returned to one of our suburbs. The judgment from which the treatment sprang was improper, because it led to the taking of chances in the presence of pus.

The other case occurred in a young man having a relaxed prostate owing to the irritation of engagement to be married. The seven glass test did not demonstrate any important organisms in the opinion of the laboratory. After considerable treatment with all the ordinary methods, the static wave current was begun with a narrow gap and at the third or fourth treatment advanced to a three inch gap without discomfort to the patient. The metronome interruption was used. About five days after this particular treatment one testicle began to swell and pass through the entire course of this complication. Ultimately both of these cases reveal the tremendous importance

of gentle methods in the presence of organisms, even though they do not appear to be active. The final result was that both these patients left my care and no doubt are blaming me roundly for everything that occurred.

For these lesions during the subacute and chronic periods the high vacuum glass electrode attached to the negative pole of the static machine, positive pole grounded, spark gap one inch, one to two ma. of current is through its actinic and mild x ray effect of great benefit. Much the same result is obtained through the Oudin terminal of the high frequency machine provided the tube is not allowed to heat up more than within the gentle comfort of the patient. The controller is rarely opened beyond the first or second terminals, and the gap should be just sufficient to activate the tube regularly. After infection is over, the static wave current may be tried, but always with the preference of error on the side of too small a current in accordance with the foregoing two case reports. Almost all these patients are the victims of a granular posterior chronic urethritis for which ionization should be used among other methods, as previously described.

The bladder is the next organ in our ascent to the kidneys, and we come prominently upon cystitis and pericystitis. I have heard a number of electrotherapeutists utter the remarkable statement that it is not necessary to irrigate the bladder. This is definitely wrong. The viscus must have as clean a mucosa as possible, no matter whether topical applications are to be made as mild antiseptics retained for a half hour, or whether electrotherapeutic measures are to be attempted. The return fluid should be as clear as it enters to the naked eye in an ordinary glass. In chronic cases often the fluid is clear except for a scattering half dozen shreds which frequently cannot be totally removed until the patient is nearly well. Inasmuch as the decomposition of urine in the bladder preceeds bacterial invasion, cleanliness secured in this way is supremely necessary. Also, as a preventive of the appearance of bacteria or as a potent means of removing them urinary antiseptics are essential. The formaldehyde group typified by hexamethylenamine are among the best. Four practical points are commonly overlooked. 1. Unless formaldehyde is found in the urine after two or three days, the particular patient is not splitting off this radical and is therefore not obtaining much value from the drug. Change to benzoate of soda or acid phosphate of soda is in such patients in order. 2. The converse is more likely to happen. The splitting up is so rapidly done that the formaldehyde overdoes its function, attacks the kidneys, or the surface of the bladder, and causes a chemical inflammation which in the case of the kidney may be hemorrhagic and in the case of the bladder may be a violent and painful cystitis. Hence, during the first two weeks of administration, the urine should also be examined for signs of irritation, such as desquamating epithelium, blood cells, especially red, and casts. If these occur in alarming numbers then the dose must be reduced or the drug changed. 3. Prolonged administration of the formaldehyde group should always be broken by periods of rest. Inertness of the medicine soon supervenes or accumulation occurs with the foregoing irritation. I prefer to omit the medicine on Wednesdays or Sundays, or both. Some authorities alternate the formaldehyde drug with another antiseptic every week from week to week, so that out of four weeks two are covered by the formaldehyde and the other two by the other drug. 4. Corrigents of many of these difficulties as well as adjuvants of the action of the formaldehyde group are such drugs as benzoate of soda and the acid phosphate of soda. The patient may be given two prescriptions to alternate by the week or by the fortnight, one containing equal quantities of the formaldehyde drug and benzoate of soda, and the other containing the formaldehyde drug with acid phosphate of soda. Such a balance in medication grants to the patient through the electrotherapeutist the knowledge of years of study by urologists. Omission of these details is not just to the patient. The indication is to decongest the inflamed area within or around the bladder. Heat is preeminently the decongesting medium, and for cases in which the oldfashioned sitzbath was available, diathermy or radiant light may be used. Diathermy quiets the circulation by causing arterial activity and relaxes the smooth muscle fiber. Both actions tend to be antispasmodic. Radiant light draws the blood from the deeper parts into the skin of the abdomen or buttocks and perineum, and further has an influence called actinic whose value is great, but whose exact nature is most difficult to explain. The germicidal and actinic influences of x ray undoubtedly have a place in deeply seated infections, such as those of the bladder and perivesical spaces.

After the infection has been brought under control, more or less completely, and organisms are difficult to find, the atony of the muscularis must have attention. In no circumstances should stimulation of the muscularis occur during acute cystitis for the very reason that these patients are best in bed and quiet. When the chronic period is present, interrupted galvanism, sinusoidalism, static wave and faradism may be employed. Always beginning with mild current, slowly ascending to tolerance and never causing irritating reaction. The bladder must always be emptied first. In other words, these artificially induced muscular activities must never work against incompressible urine retained in the bladder either through muscular spasm at the neck, or through obstruction as in prostatic disease. Galvanism is applied with much the same purposes and precautions as used by neurologists with success in neuritis, paralysis and surgical injuries in the treatment of muscles. The galvanic current may be interrupted with the finger or mechanically. If sinusoidalism is used, it is well to have the sine wave correspond with the pulse rate or a multiple or prime factor thereof so that the electrical force will not run counter to the general phenomena of the blood stream. Faradism seems to offer much in stimulating an atonic bladder or an atonic sphincter, especially after postoperative conditions. In the same way the static wave current with gap just sufficient to produce a sensation of muscular contraction may be applied alternatingly. At one session the pad may be placed over the bladder and at another session on the spine in the region of the vesical and rectal centers. As just stated, the muscularis must not

contract on an incompressible immobile mass of urine. Pain during or after the application means reduction in the strength of the treatment or even cessation, because the effect is then that of another spasm. If the inflammation lights up the treatment should cease or be changed to a more sedative quality such as the x ray. Adhesions yield to diathermy chiefly through the sedation of chronic congestion and the nutrition of arterial stimulation. Negative galvanism and the mild static wave are of importance. In contracture of the bladder, as after tuberculosis, diathermy allied to and combined with other methods is often of great service, but the pad under the buttocks and that over the bladder should be large so as to include all the surrounding tissue and so as to permit the use of large milliamperage, not less than 1,000 ma. Although the patient does not feel this current, its action is positive and beneficent.

Ureters and kidneys.—Diathermy is heat by conversion within the tissues arising from resistance to the passage of the electrical current. This is far different from ionic movement within the tissues, such as some authors claim to be the underlying basis. We have to distinguish the nonsurgical or medical cases and the suppurative lesions. In addition to the various dietetic and medicinal measures decongestion of the nonsurgical nephritis is the aim. This may be accomplished by heat through radiant light baths, the Turkish bath, and diathermy as examples. One of the most important things is that general diathermy through the autocondensation couch vastly increases elimination. Titus has shown that sweating of the skin and augmentation of the total solids in the urine, which is increased in quantity, are common results. All elimination seems to be improved. Occasionally one sees patients who probably would not be benefited by any treatment in whom diathermy fails. One patient, for example, passed through a pneumonia in the midst of a long continued albuminuria, which nothing totally abolished. Mild diathermy passed directly through the kidney between two circular five inch electrodes definitely made the albuminuria worse, and had to be abandoned. A similar result followed the use of diathermy through both kidneys with a very large chain mesh electrode on the abdomen and the patient lying on an autocondensation couch. On the other hand, the use of the deKraft autocondensation chair helped the patient, but did not totally relieve the albumin in the urine. In the suppurative lesions, such as stone and pyelitis, if only drainage is complete, benefit may be secured and is often most satisfactory. Accurate laboratory investigations must be carried out in these cases for definite conclusions, and exact comparisons with the results of other measures. Here again if electrotherapeutists guess at pathogenetic data and results their work would be discarded by urologists and will richly deserve such discard. With the modern methods of penetrating the kidneys now so safe that pyelograms may be done in the midst of hemorrhage, it is almost foolish to talk of the dangers of this work unless the urologist doing it is a tyro. I have a patient with double complete ureter with four outlets, an infection of both pelves with the Bacillus coli, and a history of removal of stone. The very measures which failed in the foregoing case of medical nephritis have practically restored this patient to health.

Diathermy may be gently used for a very short period to be followed with definitely gentle application of the static wave current, radiant light, and x ray. It is well known that in tuberculosis of the lungs diathermy may cause a severe hemorrhage either by the general congested action of the current or by the presence of an ulcerating tubercle near a bloodvessel which under the influence of the congestion opens into the ulcer and bleeds. The same result is to be expected in tuberculosis of the urinary tract, and doubtless as diathermy is used more and more by urologists, incidents of this kind will be reported in literature. Nevertheless, diathermy should not be condemned, but contrariwise used with greater caution. Conversely, however, reliance on diathermy alone is not sufficient. Valuable as it is, one of its chief functions is to prepare the way for the greater activity of other methods. Similar to the benefit of a general massage treatment of elimination, the general autocondensation treatment must never be neglected.

Prostatism comprises congestion, inflammation, abscess, hypertrophy, neoplasm and calculus. Surgical intervention must be had for abscess, neoplasm, and calculus to which electrotherapeutics may be a very good preliminary and subsequent adjuvant. The retained pus of abscess is definitely dangerous from absorption and according to rule must be evacuated, and as calculi in the prostate both originate in and are accompanied by pus they must come within the same category. This paper does not aim to take up the surgical treatment of neoplasm, typified particularly by the later methods of surgical diathermy. X ray and radium in the preliminary periods of the treatment and after the removal of the main tumor are both of great value. In hypertrophy the detail of obstruction to the outflow of the urine measured in terms of residual urine, and the tendency to decomposition and bacterial cystitis are the real deciding factors as to what shall be done. A residual urine of as little as two drachms, which is constant and increasing and shows a tendency to infection, demonstrates the needs of removing the obstruction according to the surgical rule already laid down with regard to all obstruction. This is particularly true if there is the slightest tendency toward involvement of the kidneys which may proceed not only from the ascent of the infection from the bladder but also from filtration of bacteria from the blood current into which they enter from the intestines. Most of these old patients are constipated naturally through age and the weight of the enlarged prostate on the rectum causes an obstipation. Hence one sees Bacillus coli cystitis, and pyelitis suddenly arising out of a perfectly clear sky of reasonably good health without the slightest instrumentation having been practised. Such incidents explain why prostatics with obstruction and residual urine will remain in reasonably good health until they suddenly appear totally unable to urinate and with a cystitis well established.

The seven glass test may be judiciously used in patients with moderate obstruction because it not only gives a primary index of the urinary system

from the bladder upward and of the sexual system from the bladder downward, but it tends to prove the presence or absence of pus in the prostate itself and in the seminal vesicles themselves. In the non-obstructive prostate, characterized chiefly by congestion with moderate hypertrophy indeed and as a preliminary to other treatment of the more profound cases with obstruction, we have a proper relation and alternation between the high vacuum glass electrode attached to the negative pole of the high speed static machine, the condensor-discharge electrode, radiant light, the static wave, and x ray. The principle should be laid down and obediently followed that if the response to these measures is not prompt and progressive, especially as measured by an improvement in the residual urine, it is far better to turn these patients over to surgical intervention before the obstruction reaches so high a degree that the mucosa and the muscularis of the bladder begin to undergo manifest changes. In the remote past of prostatic work arising from inexperience at that time, many unfavorable terminal results arose from the fact that the average subject had already advanced far in the destruction of the bladder mucosa by cystitis and in the weakening of the bladder wall by trabeculations, sacculations and atony. Today, operations are done before any of these conditions are more than suggested, and always before they are fully established. Failures only are seen when the patient refuses operation or when a member of the general profession does not appreciate the importance of the symptoms as they are. Too much caution cannot be enforced upon the minds of the electrotherapeutists that penetration of the bladder with a catheter without much difficulty is by no means proof of the absence of obstruction in the face of a persistantly rising and decomposing residual urine. The passage of the catheter is an artificial test, whereas the real condition is physiological incapacity of the bladder to overcome the obstruction which may take almost any form and degree regarded from inside the bladder and working toward the outer world. With regard to pus in the prostate, allusion is again worth while to the two cases reported in the forepart of this paper, of patients in whom acute epididymitis was directly induced by the application of the static wave current.

In my own practice the best results in prostatic work have been seen in the group of cases in which congestion is a predominating factor, grafted on underlying simple hypertrophy and in postoperative states. I am by no means convinced that electrotherapeutic measures can be applied with even reasonable hope of stopping the onward progress of a real hypertrophy in any material degree. As a rule, the tendency toward advance in the obstruction changes in the urine, serious alterations in the bladder, involvement of the kidneys, progress more rapidly than the gland as such responds to the treatment. These statements do not mean that electrotherapeutic measures as applied to the prostate should be abandoned but that they should be applied to a group of cases seen earlier than most of us reach the patient. I have two patients now in hand in whom the prostatic lesions are so early that it is almost possible to promise so great a correction of the process that operation may be indefinitely postponed. Time alone will tell in cases of this type. The brother in law of one of these patients has had one attack of inability to urinate so as to require catheterization, but he steadfastly refuses my request to come for a full examination. In the end he may duplicate the experience of another man who three years ago was asked to report for investigation during what seemingly was very early signs of oncoming hypertrophy. In this brief period when he did come he had a middle lobe as large as a seckel pear totally obstructing the outflow of the urine and a prostate which when removed had to be crowded into an eight ounce jar. With perfect function restored to his bladder neck, this man still has bladder symptoms because of the changes in the mucosa and the muscularis during those three years. There is one type of prostate which may be benefited rather definitely by electrotherapeutics if the obstruction is not great—the fibrous, contracting prostate. It is possible that negative galvanism in rather free but judicious doses may relax this mass of fibrous tissue materially much as negative galvanism relaxes a stricture of the urethra. I have been patiently waiting for a suitable case in which operation has been refused in order to try this method perseveringly. An obstacle is the fact that most of these fibrous cases have severe and painful obstruction and are very glad indeed to have it surgically removed.

ARTHRITIS

Lovett (8) notes the following forms of joint lesion: "1, Arthralgia without definite joint lesions; 2, acute serous synovitis with much periarticular swelling; 3, acute fibrinous or plastic synovitis, with little effusion; 4, chronic serous or purulent synovitis; 5, periarticular involvement, such as bursitis and tenosynovitis. Whatever the classification, all forms may merge one into the other, without great demarcation." Unless the diagnosis along these lines is established, exceedingly favorable results will be claimed in patients for whom in a sense the wrong diagnosis has been made. Again we are thrown back to agreement by electrotherapeutists with the diagnostic standards of other lines of medicine, otherwise their results will be challenged and that with great justice. The various means must be used in correlation and faith should not be pinned on one method alone. Diathermy may be run through and through the joint from side to side in a direct line or obliquely by having one electrode on the front part of the thigh and the other on the calf or conversely, one on the shin and the other on the back of the calf. Or cuffs may be passed round and round the thigh quite a distance above the knee, and round and round the calf an equal distance below it. Inasmuch as the muscle substance is very apt to be inflamed also, it is exceedingly advisable to include as much of the musculature around a joint in the path of the current as possible. Hydrotherapeutic methods must not be neglected, and other modalities, such as radiant light, are of great service. Stimulation in the form of the static or deKraft's high frequency brush discharge or Travell's brush discharge from the positive pole are of great value, likewise sparking from the static machine and the various forms of high vacuum or condensing discharge glass bulb

electrodes. Massage in these cases and passive motion are important. When motion becomes possible, then the static wave, galvanism, faradism and sinusoidalism may be applied to the muscles.

FUNCTIONAL DISORDERS

Few cases in urology cause more vexation than the patient with functional disorders, especially exemplified by sexual impotence. The basis of treatment must be a full determination of the underlying cause. In this point is a statement recently made to me by the physician of a certain large hotel who happens to see a great number of these patients. He gave as his opinion that electrotherapeutics have only a psychic or imaginary influence and never a definite physical one. The error in diagnosis is so wide in its range that there is small wonder indeed that the results have not been favorable. I have recently evolved the following sequence for the treatment of impotence. Two patients now under care are responding well. It is to be noted that the high frequency and other forms of current are used together, and that all avenues for treating the prostate are used and that the nervous system is reached through the spine. Finally, attention at home is not neglected. A, diathermy—prostate (rectal) 300-400 ma., 1, oudin and 2, static wave; B, diathermy—prostate (urethral) 200-300 ma., 1, oudin, 2, faradic surge; C, diathermy—spine, 1, galvanic sinusoidal, 2, phototherapy, 2, static wave; D, at home—cold douches or sponges to the spinal column.

CONCLUSIONS

Electrotherapy is not absolutely infallible. Anyone undertaking application thereof with such enthusiasm will certainly be disappointed. Its application is limited and in many instances the results are contradictory. Whenever unusually good results are expected they are not forthcoming, and when negative or disappointing results are rather in the order of events, the contrary may be seen. The real points to remember are that the apparatus now available is suitable for real progress and if distinctions in physical actions are known and proved, and if diagnoses are accurately made, then a common ground is reached from which real deductions may be drawn. As the author has said elsewhere: "There are a few basic principles which are altogether too often neglected. The patient must not be hurt or frightened; electrotherapy must be employed to augment all other measures and not neccesarily to supplant any; the current must produce profound circulatory effect of creative character and it must be opposed to the circulatory condition of indolent character due to disease; the modalities must be varied influences and finally the electrotherapeutic measures must leave no evil aftereffects. If these principles are obeyed little trouble will be met.

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Electrotherapy in Paralysis Following Peripheral Nerve Lesions and Poliomyelitis*

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The application of the advanced methods of physical therapy, especially electrotherapy to the manifold nerve injuries of civil life, is a logical sequence of the important advances in the field of peripheral nerve injuries made through the observations on a large scale during the World War. It is also a unique opportunity to demonstrate the need for close cooperation of the electrotherapist, the neurosurgeon and the orthopedic surgeon. The therapeutic conclusions of this paper are based on the following seventy-five cases observed and treated during the past three years at the physiotherapy department of the Reconstruction Hospital.

Nerve lesions.—Brachial plexus, division 1; laceration 1; compression 2; contusion 3; toxic degeneration 1. Circumflex nerve, compression 1; contusion 2. Musculospiral nerve, division 2; compression 2; contusion 3; toxic degeneration 2. Musculospiral and ulnar nerves, compression 1. Mulculospiral and median nerve, contusion 1. Ulnar and median nerves, compression 2; toxic degeneration 1. Ulnar nerve, division 1; laceration 1; compression 1. Median nerve, laceration 1. Sciatic nerve, division 1; laceration 1; contusion 1; toxic degeneration 2. Common peroneal nerve, division 1; compression 3; contusion 1. Deep peroneal nerve, division 1; compression 3; contusion 1; toxic degeneration 1. Facial nerve, infected degeneration 2.

Paralysis after poliomyelitis.—Monoplegia of lower extremities, 13; diplegia of both lower extremities, 4; paraplegia, 11.

Following traumatic or toxic injury to a peripheral nerve the following changes occur: 1. The nerve itself undergoes degeneration (distal from the seat of the injury) or minor disturbances of function. 2. The muscles supplied by the nerve become weakened or fully paralyzed and suffer from lack of nutrition due to the separation from their trophic centre, and due to lack of exercise and they also suffer from overstretching by their strong antagonists if allowed to remain in faulty position. 3. The other soft parts, joints, bones, tendons, suffer from lack of nutrition and develop adhesions, faulty positions, trophic ulcers, and other conditions. Our therapeutic efforts are directed to remedy these changes directly or indirectly.

TREATMENT OF INJURY TO THE NERVE

The injury to the nerve itself has to be remedied by surgical interference, nerve suture or nerve liberation as soon as the surgeon has decided that there is complete or partial division or continued compres-

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sion. Regeneration is effected by the descent of new axis cylinders from the intact central end at a rate of one to two millimetres a day. The deep conversive heat produced by diathermy seems to us to be the most rational physical measure in indirectly assisting the regeneration of the nerve by its nutritional and absorptive effects. According to Langley (1), the atrophy of muscles and later the fibrosed state is due to the fibrillation which always follows severance of the nerve, and on this basis deKraft (2) was the first to advocate diathermy as its effects are sedative and it arrests muscle fibrillation. Diathermy also meets the indication for warming up the parts preceding the muscle treatment. For these reasons we have employed diathermy as the first step in treatment of all of our cases of nerve injury where there was real paralysis present, with extended atrophy of muscles. If a whole extremity was affected, as in case of a brachial plexus injury, diathermy was applied with one moulded electrode just above the shoulder and with the hand in a water bath. In other cases the cuff method or other methods of longitudinal warming up were used. Prolonged heating up to thirty minutes at moderate milliampere reading is preferable to short applications at high metre reading.

Tinel (3) and a number of English and French authors state that the simple passage of a galvanic current seems to be able to stimulate regeneration of a nerve. We feel that diathermy for the reasons given surpasses the unquestionable electrolytic and nutritional influence of the straight galvanic current. We use galvanism only in cases of scar tissue about a nerve for its solvent effect on scar tissue.

TREATMENT OF INJURY TO THE MUSCLE

A muscle deprived of its trophic nerve centre, and untreated, will rapidly undergo atrophy and gradually lose most of its functions. The aim of skillful physical therapy is to preserve as much as possible the function of the muscle so that when the normal nerve conduction and trophic action returns it will not find a useless degenerated mass of fibrous or fatty tissue.

The properties of a normal muscle are (4): 1. irritability, its ability to respond to a stimulus; 2, contractility, its ability to shorten itself in response to a stimulus, usually the impulse of the intact motor nerve; 3, extensibility, the power of lengthening without tearing; 4, elasticity, the ability to regain its normal state after having been extended. Every normal muscle is slightly stretched between its origin and insertion and this tends to maintain the tone of the muscle. In paralysis of a muscle or a group of muscles, the antagonists tend to overstretch the affected muscles constantly and thus deprive them of their elasticity. The first indication in the maintenance of the condition in paralyzed muscles is therefore an orthopedic measure, i. e., to assure complete relaxation of all paralyzed muscles and prevent the shortening of their antagonists. This is accomplished by proper splinting. These splints must be worn until the recovering muscles have attained sufficient tone to exclude their overstretching by their antagonists. The fear of overstretching on the other hand should not prolong splinting unduly as prolonged immobilization in itself will cause periarticular joint changes and muscle atrophy. Early careful passive movements should be instituted through cooperation of the orthopedic surgeon and physiotherapist.

The maintenance of the contractility, irritability and the proper state of nutrition of paralyzed muscles is by far the greatest problem of the electrotherapist. Souttar and Twining (5) in their recent work state, "were we limited to one method of treatment and had nothing but the muscle to consider, we should ourselves prefer electrical stimulation to all other methods of maintaining nutrition in the muscles." The main function of every striated muscle is to contract in response to voluntary impulse. Muscle innervated by an injured nerve, according to Tilney (6), does not contract voluntarily or reflexly and being unable to perform its natural function of contraction tends to revert to noncontractile connective tissue type. By electrical stimulation we can cause movements similar to the normal ones and thus preserve the functional properties of the muscle until the normal impulse returns to carry on the work. According to Burke (7) contractions of any sort, preferably short contractions, exert massage effects and help to prevent fibrous formation within the degenerated muscle. If the muscle is not fully paralyzed (does not show complete reaction of degeneration) but is only weak, the causing of contractions not only prevents the atrophy of the paralyzed muscle bundles, but also exercises and strengthens the nonparalyzed part of the muscle and thus enables it to do compensatory work for the weakened part.

ELECTRICAL STIMULATION WITHOUT CONTRACTIONS

While most electrotherapists and neurosurgeons fully accept this line of reasoning and are satisfied with the clinical results achieved by eliciting muscle contractions, there are in the recent literature statements to the effect that beneficial effects can be achieved by electrical stimulation without causing muscle contractions. Turrell (8) for instance, who previously strongly advocated currents causing contractions, doubts, in his recent textbook, whether a really efficient contraction can be excited in muscle whose nerve has been completely severed as the resulting contraction is confined to a few fibres and occurring in single isolated shocks can have but little influence on tissue drainage. He advises the use of the surging sinusoidal current to the strength necessary to excite faint contractions in the neighboring muscles. Dr. Edward C. Titus has recently recommended that paralyzed extremities be treated with the slow galvanic sinusoidal at a strength which will just cause mild contraction of the face muscles of the patient without regard to whether a contraction of the paralyzed muscles is elicited or not. Cumberbatch (9) also states that there is abundant clinical evidence that paralyzed muscles showing the reaction of degeneration can be successfully treated by a current which causes no contraction or rather no shortening.

The rationale of electrical stimulation of muscles without contraction is based on its influence on another physiological property of the muscle which has been disregarded by most investigators, i. e., its action on the excitability of the muscles. One of the basic laws of electrophysiology is that a constant (galvanic) current produces around the cathode an area of increased irritability of the nerve and muscle

(Pflüger's electrotonus) and subsequently there is response to smaller amounts of faradism and galvanism. If the passage of the stimulating current is repeated regularly the temporary increase of irritability becomes permanent, according to Kowarschik (10). Experiments in physiology prove that every impulse causes some change in the molecular structure of a cell, especially in a nerve cell, and this enables the cell to respond more promptly if the same stimulus acts again. The nerve cell has the property, therefore, to preserve the irritability. Repeated stimulation by a rhythmically interrupted galvanic current will not cause at first any contraction in a bundle of unstriped muscles but continuing these interruptions for a while the muscle will finally begin to contract. The summation of the preceding stimuli has resulted in a stimulus which exceeds the threshold of excitation. Animal experiments have proved without exception that paralysis caused by cutting symmetrical nerve trunks will disappear quicker on the extremity treated by electricity than on the nontreated one.

The enumerated basic experiments of the influence of systematic electrical stimulation on nerve and muscle irritability explain why favorable results can be obtained even without causing muscle contractions. It remains to be decided by observation in large numbers of parallel cases whether better clinical results are obtained by using a technic causing contractions or not. In either case, both experimentally and clinically it has been found that rhythmically varying currents are more effective in the stimulation of paralyzed muscles and nerves than continuously flowing currents. Whichever procedure is used, part of the favorable result in hastening recovery is undoubtedly due to the general nutritional effects of the electrical stimulation preceded by the warming up of all structures. Langley (11) states: "It would be better to produce the accessory results of contraction, that is the nutritive improvement, without the contraction itself."

PRODUCTION OF NUTRITIVE IMPROVEMENT

In our clinical work we utilized the principle of producing nutritive improvement without contractions in muscles which have lost all electrical response and also in cases in severe stage of paralysis. By using weak sinusoidal currents persistently we found that the wasted muscles gradually started to fill out and electrical response first to interrupted galvanism, later to sinusoidal, returned in numerous instances. In cases of severe paralysis or immediately after nerve suture we were very careful not to fatigue the weak muscles by strong interrupted galvanism. Diathermy or radiant light followed by gentlest massage was given for nutritive improvement and followed by weak sinusoidal current, beginning with two to three rhythmic applications over each muscle. The great majority of our cases, however, were past the acute stage and were muscles with partial or full reaction of degeneration, i. e., loss or diminution of faradic response and sluggish or slightly diminished galvanic response. We found that in these cases exercise would be of decided benefit to the muscles and our clinical results were satisfactory. We always used the current which elicited response in the gentlest way in the individual case.

IMPORTANCE OF PRELIMINARY MUSCLE AND NERVE TEST

The first step in planning and ordering electrical treatment in any case of paralysis is a careful and accurate muscle and nerve test, the technic of which is described in a previous paper (12). All muscles of the affected part are tested by faradism and with the condenser set or interrupted galvanism and the comparison with the muscles of the healthy side is charted. If there is response to faradism it is our method of choice for the treatment, as the faradic coil imparts impulses nearest to the impulse of normal nerve stimulation. Experiments of Debadet (9) have also proved that rhythmically varied faradic current caused more than twice the growth in muscles than galvanism.

USE OF FARADISM

In applying faradism we are using either the Bristow coil or the high tension faradic coil. The Bristow coil gives a low voltage faradic, relatively painless current and its strength can be varied very nicely by sliding the iron core in or out of the primary coil. In the high tension faradic coil of Wappler's make, the tension of the current and thus its penetrating or stimulating quality can be regulated by selecting different wire lengths of the secondary spiral; at the same time the current can be made surging and thus much more pleasant and effective by putting it through the sinusoidal part. The technic in each case is to apply an indifferent electrode over the site of the injury—in poliomyelitis over the spine and a small active electrode (an inch to an inch and a half in diameter) over the individual muscles causing six to ten contractions of each. Treatment is usually given three times a week.

To exercise weak but not paralyzed muscles, we have been using recently with satisfaction the clonophore, an instrument delivering a rhythmically interrupted faradic type of current as described for the first time by Dr. Edward C. Titus (13). The contractions caused by this instrument are much more vigorous, yet painless, and at a slow rhythm the muscle exercising action is greater than by the simple faradic current.

USE OF SLOW SINUSOIDAL CURRENT

In muscles lacking faradic response as they do in all cases of real paralysis, the slow (galvanic) sinusoidal is the current of choice. It produces a stimulus of long duration and slowly surging quality to which the paralyzed muscles respond very gently and painlessly. We are always using the method of monopolar muscular stimulation, i. e., a large indifferent electrode over the cervical or lumbar spine or at any place central of the lesion, and a small active electrode over the individual muscles. In all these cases the normal motor point is displaced distally (towards the tendon) and to save time in subsequent treatments it is advisable to mark with indelible pencil the most effective point of stimulation for each muscle. According to the response each muscle is made to contract half a dozen to a dozen times. It is most important that the extremity treated should be warmed preceding and fully relaxed during the treatment. In rare instances, and then mainly for testing purposes, we have used the bipolar method

of electrical stimulation—two small active electrodes over an individual muscle, thus allowing great concentration of current.

SINUSOIDAL VS. INTERRUPTED GALVANIC

The use of the interrupted galvanic current for the eliciting of contractions gave rise to considerable controversy in the past. As long as we believe that it is beneficial to cause contractions in degenerated muscles, interrupted galvanism will supply a need in cases which do not respond to sinusoidal. The difference of action is based on the physics of the two currents and the stage of degeneration of the muscles. In order to elicit a response in a muscle by means of an electrical current, this current must reach a certain intensity and in addition, must last for a certain period before any contraction will occur. In paralyzed muscles a stimulus of longer duration and greater intensity is required. The gradually increasing stimulus of the slow sinusoidal is often not sufficient in advanced degeneration of muscles to cause contraction: it does not last long enough at a certain voltage. Hand interruption prolongs the duration of current flow up to one tenth of a second (the average normal muscle responds to a stimulus lasting one one thousandth of a second; the paralyzed muscle to a stimulus of one one hundredth of a second and more) and at the same time the current strength can be easily increased to the limit necessary. This explains why interrupted galvanism with its longer flow and higher voltage causes response in cases where sinusoidal does not. We use interrupted galvanism with the same technic as sinusoidal, the active electrode being attached to the negative pole of the machine. It is interesting to note in many cases that at first it is necessary to use a larger amount of current to cause contractions, and after the first one or two contractions we can elicit response with markedly less current. One can aptly express it by stating that the muscle needs waking up at first and then responds more briskly. We will also find in a goodly number of cases that after a few treatments with interrupted galvanism response can be elicited by the slow sinusoidal galvanic current. In such cases, naturally, the method of treatment is changed to sinusoidal.

As systematic electrical stimulation, along with other adjuvant treatment is continued, we find that the atrophy gradually disappears and the muscle response improves. Testing by the condenser set every four to six weeks enables us to chart this progress in figures. Finally a time comes when there is the first indication of return of voluntary motion in one or more of the paralyzed muscles. This is proof that the nerve trunk and the motor end plate have regenerated. Response to faradism returns about this time or as a rule somewhat later and a warning has to be given not to replace galvanism too quickly by the faradic current. A muscle just recovering is sensitive towards the more exhausting exercise with faradism and it can be easily tired out so that it will take several days to elicit faradic response again.

USE OF OTHER PHYSICAL MEASURES

While electrical stimulation is our main therapeutic standby in improving the condition of paralyzed muscles, other agents of physical therapy are of considerable importance.

Radiant light and heat is invariably used as an introductory treatment in all cases to promote local nutrition, improve skin conductivity and muscular response by its warming action. It is applied for at least fifteen minutes at a distance of comfortable toleration. In cases of scar lesions combined with peripheral nerve injuries, on account of the disturbed sensation and lack of normal collateral circulation, unpleasant and slowly healing burns easily develop. In such cases, therefore, at least one and a half of the ordinary distance should be used. In cases of cold, clammy, tender extremities we found the whirlpool bath an efficient adjunct preceding electrotherapy used at a temperature of 100 to 110° from one half to one hour. Under the combined action of heat and gentle massage the injured limb becomes warm, red and painless, ready for further treatment.

Massage as an adjunct can be used to advantage although there is modern experimental evidence to prove that it is only of slight benefit in preventing atrophy of paralyzed muscles (14). In paralysis, according to Mennell (15), only the slightest form of massage is indicated because, owing to the atrophy of the paralyzed muscle, pressure may be transmitted to the bloodvessels, causing paralytic dilatation; thus, heavy massage will defeat the end sought. We use massage advantageously for the further improvement of local circulation and for the mechanical elimination of waste products, and ten to twenty minutes' time for a massage treatment is all that is indicated.

Manipulation, active exercise, reeducational movements form an important part in the latter stage of our physical therapy, especially after the response of muscles is beginning to return. A skilled worker will be able to lead the patient to produce contractions by voluntary impulse instead of by an electrical one. All exercises are to be taken after preliminary preparation by heat and electrical stimulation. It has to be remembered, however, that there is a real risk of giving a patient too much physiotherapy and this holds true especially in poliomyelitis cases in which only the gentlest of electrical stimulation and short massage treatments are advisable at first.

The indications for the treatment of the third set of changes in peripheral nerve injury—the changes in the other soft parts, and joints, bones and tendons—are as a rule fully taken care of by the systematic use of the combined methods of physiotherapy as enumerated.

OBSERVATIONS IN INFANTILE PARALYSIS

From a histopathological point of view the changes in a peripheral nerve following direct injury are the same as following poliomyelitis. There is true degeneration of all nerve fibres the trophic centres of which in the anterior horn have been put out of commission. For this reason the treatment of the two conditions is identical, and we followed the same clinical routine in both types of lesions. We have, however, a few important observations to relate in regard to poliomyelitis. The first one is that no case of poliomyelitis is too old for instituting physiotherapy. It takes a long time for the regeneration

of muscles to become complete after the original attack and therefore much can be accomplished even at a later stage in aiding the regenerative process in muscles. Another interesting experience is the sudden improvement in some old poliomyelitis patients soon after proper treatment has been instituted. Turrell (8) says in this respect "it is almost as though there were some latent recovery lurking in the muscle needing only the electrical stimulus to reveal its presence." The third experience is that long, persistent treatment is the keynote of success in these cases, skillfully utilizing all therapeutic measures and avoiding fatigue at any one time. It was satisfactory to record good results after treatment extending over one to two years.

RESULTS

Our results in paralysis following nerve lesions were full recovery in all cases of early nerve suture and in all promptly treated minor nerve injuries. Not so satisfactory end results were achieved in cases which came to us after long standing and which originally had not been recognized as nerve injuries. In these cases the secondary muscle degeneration, the contracture of the antagonists and the joint ankylosis had already caused too much damage for the most skillful supportive and physical therapy. Persistent treatment, however, was able to achieve considerable functional improvement in most of these cases.

CONCLUSIONS

1. For the best interest of the patient a close cooperation of the electrotherapist, the orthopedic surgeon and the neurosurgeon are imperative in every case of paralysis following peripheral nerve lesions or poliomyelitis. The earlier proper physical measures are instituted, the more satisfactory will be the results.

2. Electrical currents simulating the natural physiological impulse are the most valuable single agents in maintaining and restoring the power in paralyzed muscles. Rhythmically varying currents of low tension are the most effective.

3. No electrical modality should be instituted in any case without a preliminary accurate electrical muscle and nerve test.

4. Adjuvant measures of physical therapy may be instituted according to the stage of paralysis.

5. Definite technic and persistency in the measures instituted will bring acceptable results even in late and neglected cases.

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The author's references will appear in his reprints.

The Tonsil and the X Ray

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Although my subject is the x ray and the tonsil, I crave your indulgence to bear with me for a few minutes on the scientific basis of electrotherapy or physiotherapy and x ray therapy can in my opinion be included in physiotherapy. Electrotherapy is a science and will do much for medicine, if the medical world will give it a fair trial.

Charles F. Stokes, former surgeon general of the United States Navy, said: "In coining the term electroionization, I have striven to emphasize the point of using in treatment, radiations of suitable wave length, and the dose so small as to affect the groupings of electrons in the atomic structure of pathological cells only, cells that have lost, or have parted with sufficient electrons to disturb their equilibrium. Such cells, groups of cells and organs, in a state of health, should be able to maintain an electronic equilibrium, except as it may be varied in response to excitations and transmissions within normal ranges.

"To electronize a tissue, the electronizing dose should be so minute, that it will not seriously disturb normal tissue cells and yet be sufficient to equilibrate or rejuvenate of course with obvious limitations, abnormal organs.

"Pathological tissue has been shown to be positive in charge, probably by reason of disturbances in the outer shells of its atomic structure, whereby negative electrons have been parted with, they in turn accomplishing less stable groupings. If this biophysical picture is true, then we, by electronizing such a field, may accomplish selective electronization, if the pathological tissues take on, in the outer shells of their atomic structure, sufficient negative electrons, knocked from unstable groupings, to enable them to resume or approach their former equilibrated condition."

Crile, who is as renowned a scientist as a surgeon, and has studied biophysics and biochemistry, says: "Every organic cell consists of two distinct parts—a nucleus and a cell body. The nucleus and the cytoplasm of the cell body require different stains, the nucleus being acid and the cytoplasm being basic or alkaline."

The cell is bounded by a lipoid membrane, a little surface film lipoid material, and the boundary of the nucleus also is a thin lipoid membrane. These membranes are selectively semipermeable, that is to say, each permits certain ions to enter and pass out of the cell or the nucleus. The mass of cell as a whole is made of colloidal material. If the selective semipermeable membrane is destroyed, the cell as a functioning unit is destroyed. If one destroys the membrane, the cell dies, that is to say, the membranes are absolutely essential to the life and function of the cell, and the cells in turn are essential to the life and function of the animal or man. Whenever the physical change, either in the nucleus or in the cell body, has progressed to such a degree that they no longer stain differentially, the cell cannot do its work—it is dead.

"In order that the cell may function and live, why

*Read before the Medical League of Philadelphia, February 23, 1925.

is it necessary that the nucleus shall remain acid and the cell body alkaline, and that the thin intervening membrane shall remain semipermeable? Because—and now I come to theory alone—the cell is postulated to be an electrochemical mechanism. Its life and function are dependent on the maintenance of difference in electric potential between the nucleus and the cell body. In accordance with this conception, the discharge of a cell is like the discharge of battery—the cell, like the battery, becomes exhausted. Life itself is dependent on the maintenance of this difference in potential, or as the physiologist would say, the maintenance of acid alkali balance in the body; but when physiologists speak of acid alkali balance of the body they really refer to the acid alkali balance between the cell body and the nucleus."

So you see that Crile holds the cell, the very basis of life, to be an electrochemical mechanism—an electric battery.

Some years ago, at one of the meetings of this society, Dr. Edeken reported that x ray is used with success in tonsillitis. When I heard that, I felt that the x ray men must be medical hogs; they want to usurp the medical field all to themselves. But one or two years passed and I began to try it. Meeting with success I was relating my experience to Dr. Charles Mazer with whom I was sharing my office.

Said Dr. Mazer, "Two years later, you will forget all about it." Three years passed since, and not only didn't I forget about it, but I am greatly enthusiastic about its value and am hear to remind you, nay more than remind, but plead with you, to give the matter serious consideration.

Histologically the tonsil shows a similar structure to that of the lymphoid glands, with the exception that it is covered on one side by mucous membrane with crypts dipping down from the surface. These crypts have been described as natural test tubes for the growth of bacteria.

Patients that are subject to recurrent attacks of tonsillitis and pharyngitis are continually bathing their pharyngeal tissues in pus coming down from the infected crypts and sinuses. The infection in these cases often involves not only the tonsils and adenoids, but extends to the lymph structures on the lateral and posterior walls, and infratonsillar nodule, lingual tonsil and the cervical glands of the neck.

What is the effect of x ray on these tissues?

1. In proper doses and technic they will remove almost all the lymphoid tissue.

2. They asepticize or sterilize the whole field of penetration. That it will do the first; that is, remove the lymphoid tissue, need not be again said.

It is practically an established fact, that lymphoid tissue is highly susceptible to the rays. That it will do the latter, that is, sterilize the penetration field, I will quote a few instances to substantiate my contention: x ray today is the standard treatment by all dermatologists for acne, furunculosis, carbuncle and other infections of the skin.

Hickney, of Ann Arbor, and Kahn, of Detroit, have been able to clear the throat of diphtheria carriers in from two to four days, administering a fractional dose of x ray in eighty per cent. of the cases so treated.

Schrader, of Berlin, reports results in erysipelas with only one sixth of a skin unit dose.

Kemp, of Leipzig, reports the healings under the rays of a circumscribed peritoneal suppurative process originating from an appendix or following an abortion.

Van Ree, of Amsterdam, Holland, reports 470 cases of glandular lesions of the neck and axilla and groin, a clinical cure in eighty-five per cent. of cases in a few months. Improvement was realized in every instance. I can quote many instances.

If then x ray treatment can and does accomplish these things, that is, destroy the lymphoid tissue in the tonsils, not injuring the other tissues, and also sterilizing the whole field of penetration, the fair question would naturally follow, why not adopt it as a rational method for the cure of chronic tonsillitis and pharyngitis instead of the knife?

What advantages, if any, does this method offer over the knife? Operative treatment involves: 1, Hospitalization; 2, anesthesia with possible risk of pneumonia, lung abscess, hemorrhage. At best, pain, loss of weight, loss of time, loss of tonsils with scarification, a tissue injury and rarely, fortunately very rarely, loss of patient. While x ray treatment involves none of these risks, with hardly any loss of time, the pathological tissues are removed not only of the tonsils but in the whole field of operation, and yet, the tonsils are not lost to the patient.

Now some of my nose and throat specialist friends may object, and say that this method does not cure all cases. Correct, but does asphenamine cure all cases of syphillis? Does antitoxin cure all cases of diphtheria? Is there any one here who will dare deny these remedies in cases where they are indicated? But, say the nose and throat men, why not operate?

Let us compare results. Dr. Witherbee, of New York, who perfected the technic and who probably has done more work in this line than any one else in America, reports eighty per cent. cures in cases observed from one to three years in which the patients suffered from recurrent attacks of tonsillitis and pharyngitis. When I recently met him he told me that he has records of between two thousand and three thousand cases that gave the same results. Other authorities corroborate these findings.

My own experience includes thirty-six cases, too small a number to tabulate and draw conclusions from, but enough to base an intelligent opinion upon. Some of these patients I rayed about three years ago, others two and one year since. In about eighty per cent. the tonsils have been dissolved, nearly all have been markedly reduced in size, while in only two cases was an operation necessary. Nearly all the patients that I have rayed and succeeded in following up, report that they are no longer subject to attacks of pharyngitis, tonsillitis, or laryngitis.

I use Witherbee's technic, the factors of which are—seven inches spark gap, five mil, ten inches distance, time four minutes, three mil aluminum, eight to ten treatments at intervals of two weeks.

On the other hand what are the results of operative treatment? I shall quote from a paper by Dr. Laura A. Lane, Minnesota: "The tonsil question is still one of the most discussed in medicine. Too little attention has been paid to the after results of tonsilectomy and too many operations are done without securing permanent results."

A report from Johns Hopkins Hospital based upon one thousand patients examined before operation and from one to four years after operation, is illuminating: fifty-eight per cent. showed mouth breathing after operation; fifty-five per cent. showed evidences of tissue left after operation; forty per cent. of patients operated upon were still subject to sore throat, angina often being more diffuse.

Tonsillectomy is rarely of benefit in deforming arthritis, never in acute chorea, rarely in acute rheumatic fever, endocarditis and chronic kidney lesions. It is not I who says that, it is a report from Johns Hopkins Hospital.

The same author further says in his paper that during the year ending September, 1922, he had under treatment and followup fifty-two patients treated with röntgen ray, and twenty-four with radium or both combined. The results to date have been very satisfactory. His conclusions drawn from literature and personal experiences are:

CONCLUSIONS

1. A study of more than thirty thousand patients from various sources one to four years after operation shows permanent results in only about half of total number.

2. The tonsil has a function and greater care should be taken to preserve this, especially in childhood.

3. Greater care is necessary in studying patients with diseased tonsils and in selecting patients for operation.

4. Röntgen ray and radium offer a safe method of treatment in carefully selected cases.

5. Results in children and adults have been most striking in cases of decided lymphoid hyperplasia type; also in patients with cervical adenitis associated with tonsil pathology.

6. Longer study is needed to prove permanent disappearance of all symptoms accompanying tonsil and adenoid disease, and some further investigation on the types of tonsils best suited to this form of therapy is also needed.

During my twenty-six years of practice, while I was not a therapeutic nihilist, yet I never felt sure of my remedies with the exception of a few well known drugs. You may consider it presumptuous on my part, but I can't help feeling that in x ray, diathermy, quartz light and some of the other electrical modalities, we have today medical tools of precision. One who is skilled in electrotherapy is as much assured of his position as the surgeon. Given a certain pathological condition, he will know exactly what to do and what to expect.

But two elements are essential: correct diagnosis and proper technic with proper modalities. Let no man buy a diathermy machine or any other physical appliance and set himself up as a physiotherapist for he is doomed to failure. One needs all the modern modalities and one must study the machines and the technic.

X rays will remove tonsils of the hyperplastic type almost as sure as the knife without its risks; will cure ninety-six per cent. of acne cases; a large percentage of adenopathies; a large percentage of the cases of exophthalmic goitre; nearly all cases of fistulæ, and will absorb many fibroid tumors.

Diathermy will benefit and often cure many inflammatory conditions and diseases. Quartz light is useful and highly beneficial in anemias and debilitated conditions, superficial ulcers and various skin diseases. It is a great constructive agent, an excellent adjunct to the other electrical modalities, and is a specific in rickets.

You may consider me too enthusiastic, too empirical or even not scientific, but I can't refrain from stating that radiant heat in conjunction with quartz light and occasional ionization doses of x ray will benefit many cases of duodenal and gastric ulcer.

The riddle of the universe is motion. The key to this riddle is the electron. When we know the laws of the electron, there will be less mystery in regard to disease.

The Hepatic and Cardiac Syndrome*

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Success in any line of endeavor is largely the result of close application to certain principles and details. In the practice of medicine success depends upon a proper diagnosis, following which correct treatment is possible. For this purpose we must make a careful survey of the patient from many viewpoints, a careful and painstaking history being one of the features, as well as a study of the various symptoms, both subjective and objective. Following with a physical examination and such laboratory studies as are essential, we will have a fair chance of instituting a line of therapy that best judgment suggests. Many of us in the past have failed to carry on in the careful manner just outlined, and particularly in those cases that appear, upon the surface, to be light, or at least lacking in danger.

The cases to be outlined come within this category at one period of their existence, which makes it all the more important for us to consider them at a stage when amenable to therapy, as well as later when they become a menace to life.

We all frequently see the socalled bilious attacks, and no doubt most of us have passed them by lightly with a prescription for calomel or some other cholagogue, and some reference to diet. With recurrent attacks we give such cases some further thought, particularly when the victim suffers from a severe sick headache, yet, even so, we do not appre-

*Read before the American Electrotherapeutic Association, New York, September 11, 1924.

ciate what the pathological process is, or we would be more active both in advice and therapy. For this reason, and with the view of emphasizing the importance of proper care, I present this paper. That these repeated bilious attacks are fundamentally serious can be proved, and I hope to be able to establish their significance as a factor in producing a state of chronic ill health unless relieved or prevented.

First, it will be proper to study briefly the subject from its anatomical and physiological sides. We recognize the location of the liver, that it reposes below the diaphragm in the right side of the abdomen, reaching down with its lower border just flush with the rib line. We also know that it is a blood organ, containing normally one quarter of the blood of the body. Its circulatory system may be thus given in brief: The portal vein, which drains the blood from the alimentary canal, breaks up into branches, which lie at the periphery of the lobules forming the interlobular veins and their branches or capillaries, passing inward between the columns of cells to join the intralobular vein at the centre of the lobule. These in turn empty into the hepatic veins and inferior vena cava. For oxygenation of the working liver cells the hepatic artery supplies the arterial blood. This artery arises from the celiac branch of the aorta. The arterial supply practically follows the venous in its ramifications of the lobules and cells, and the capillaries complete the circuit by free communication with those derived from the portal system. Lying, as this organ does, at the gate of entrance of blood from the alimentary tract into the general circulation, it is influenced materially by the digestive process, at which times the liver becomes overfilled with blood. Normally this congestion is purely physiological and transient. It becomes pathological only after repeated digressions from proper dietary and other regulations, which in time produce a prolonged and persistent circulatory stasis, and irritation of the hepatic cells. So long as these irritating factors remain, so much more marked becomes the stasis, and it is during this progressive stage that the socalled bilious attacks increase in frequency and severity. Right here, were the condition properly recognized, suitable therapy would prove most efficacious and would prevent the disastrous sequel of this syndrome.

If we study the physiology of the organ, we will more completely recognize the important part it plays in the human economy. We will also appreciate its wonderful ability to function in spite of the repeated abuses to which we subject it. No other organ will stand for such treatment.

Not only does the liver secrete bile and store up the glycogen of the body, two important functions, but it also acts as a great chemical laboratory, receiving for action all the products of digestion directly from the alimentary tract, breaking them down and converting them into other substances according to the needs of the body. It seems to have been proved that "the liver is the chief seat of the conversion of ammonia salts into urea, and that it is responsible for the breakdown of the products of protein digestion which are not directly required for replacing tissue waste. The aminoacids normally produced by a protein digestion are absorbed without further change in the blood stream. The major portion of the protein is taken up by the liver, where it under goes deamination, the nitrogen moiety being rapidl converted into urea and excreted by the kidney while the nonnitrogen moiety is carried to the work ing tissues, to which it serves as a ready and im mediate source of energy." (1)

For establishing and sustaining metabolic equi librium, the liver functions must be kept active. An divergence from this normal, whether from extrinsi or intrinsic causes, must be corrected if we can hop to maintain a state of health.

The liver so far has received most of our atten tion in the discussion of the syndrome, but it is no alone involved. We have practically every abdomina organ, the local circulation, and the heart and aorta each and all playing their part in the condition There is a progressive circulatory stasis, the live being the first organ to become affected, as has bee explained. The splanchnics and inferior vena cav appear next in order, and naturally all the organ which receive and discharge their blood supply suf fer from the stasis. As the pressure from engorge ments becomes increased, we will find the right heart next involved, and finally, owing to the *vis a tergo* and *vis a fronte,* the left heart suffers in turn and with it we have a slowly dilating aorta. Th damming off of the venous return from the legs an feet causes their swelling, one symptom that some times suggests Bright's disease, which after being disproved by numerous uranalyses, still causes doub in one's mind until it is thought out from the view point of mechanical obstruction. The same applie to the serous diarrhea so often noted in these cases it is due to the obstruction from mechanical pres sure of the liver, and the diarrhea is purely the resul of nature's effort for relief.

This line of thought—theory, if you care to call i such—is the result of experience with a large numbe of such cases, and is entirely at variance with th accepted statements found in the various writing and textbooks. Proof of the correctness of my con clusions is shown by results of treatment in som instances, and in others by examination of patient made at different intervals, by which progress of th symptoms was noted when treatments were no given. If you will look into this matter, you wil usually find the statement made that cases of cardia dilatation and some other heart conditions are fol lowed by hepatic engorgement. By a citation o cases I hope to prove that the latter sequence is in correct.

When the process in slow, which fortunately i most frequently is, the cardiac involvement is a gradual one, thus saving the patient from any grea amount of dyspnea except under stress. This short ness of breath is Nature's safeguard and offers a warning to the patient that he must seek medical aid There are not a few of the other type of cases usually in robust and stout persons, in whom th myocardium is under too much stress from over eating or some other fault, and a slight overexertion or a severe attack of indigestion with great flatulence will cause a sudden dilatation and death. A case in point is the following:

Case I.—B. C., a business man, aged fifty-five tall and stout, came to me for an examination and opinion with the expectation of placing himself under

eatment a month or so later when business would ow him time for it. His symptoms were typical of is syndrome, moderate hypertension with a high astolic, dyspnea under ordinary exertion, a ndency to attacks or indigestion, flatulence, oderate insomnia, extrasystoles, toxic headaches, d the various minor symptoms usually found. Exnination by palpation and percussion showed a er extending to the pelvic brim, slightly tender on pressure. Colonic flatulence was marked, so e examination was difficult. The heart was normal to murmurs, but there was myocardial insuffiency, as shown by the sounds and pulse. The right art was slightly enlarged, but compensation was parently established, and as there were no clear idences of advanced arterial changes, he was alwed to carry out his plans, although warned as to ssible dangers. His family was told candidly of e dangers of procrastination as well as those of erexertion, and cautioned to keep in close touch ith him in his business. This was possible, as his vo sons were associated with him. A few weeks ter, while on his way home from business, he opped dead on the ferryboat to which he had idently hurried, death, no doubt, being the result a sudden cardiac dilatation.

A more recent case, also fatal in its outcome, ustrates further my contention of the primary liver gorgement with secondary cardiac complications.

Case II.—L. R., aged sixty-eight, came to me cently for an examination and treatment. He was retired business man, large in build, of a strong d robust constitution, with a history of having rely been sick. I had known him for a number of ars, having been at one time his family physician. wo years ago he came down for examination and lvice, but could not remain for treatment. At that me his liver was markedly engorged, extending out two inches below the rib border, and was nder to palpation. There was no cardiac enlargeent, and his symptoms were not referable to that gan, being purely digestive in nature. There was oderate hypertension, no kidney involvement so ar as could be determined by uranalysis, indican eing the sole abnormal content. He and his wife ere informed of the result of the examination, and e was advised to seek the proper treatment at or ear home until he could return and stay. His home hysician did not concur in the diagnosis, informg him that there was nothing the matter with his ver.

After some months of unavailing treatment e sought three other physicians in turn, each givg him the same statement that his trouble was rely digestive, although later one of them told im he had " heart trouble" and treated him for at.

His recent visit to me was made with the thought at further advice and treatment might be had, as e was not satisfied with what was being done. Durg the two years' interval between the two visits, his mptoms had become more decidedly cardiac, and the time he came into the office he was markedly yspneic from the exertion of coming up the few eps, the only exertion he had been under. The yspnea was alarming in its severity, and several inutes elapsed before he was able to converse. After a time of resting, he gave his history of the two years' experience and his symptoms.

For some months he had gradually suffered more and more from dyspnea under slight exertion, this having started about a year before, when under stress that seemed unavoidable at the time. Dyspnea had become his cardinal symptom. He suffered from indefinite pains, largely substernal but a times epigastric, never severe, but disturbing. Attacks of indigestion, with marked constipation, were the principal features aside from those already mentioned.

An examination was made with the following results: marked cardiac enlargement, weak myocardium as registered by the sounds, aortic regurgitation, arterial hardening, liver engorgement, as determined by palpation, extending almost to the pelvic brim, the sensation of a doughy feel to finger pressure. The colon was flatulent and sensitive to deep pressure. Uranalysis was negative. Blood pressure, systolic 242, diastolic 112, pulse 130.

X ray findings were as follows: chest, six feet tube distance, showed the greatest heart diameter, seven and a half inches, arch of aorta, two and a half inches in diameter. Haziness at base of lungs, apparently due to hypostatic congestion, but later shown to be due to an effusion. X ray of abdomen showed lower border of liver one inch above iliac crest with patient in prone position. He was informed as to the seriousness of his case, and warned against any undue excitement or exertion, and his wife was candidly told of the immediate danger. A few days later he died in bed while sitting up waiting for a glass of water to be brought to him.

Diagnosis of this syndrome should be easy, if we will bear in mind the more or less constant symptomatology. Attacks of dyspnea with substernal distress or pain offer a clue which is at least suspicious. Migraine is not a constant symptom, therefore not diagnostic, yet in conjunction with the above and some swelling of the feet and legs and negative urinary findings, it may be considered as fair evidence. Constipation alternating with diarrhea may be accounted for by a mechanical obstruction through the hepatic engorgement together with suppression of bile. Irritation of the intestinal glands no doubt has a bearing, as shown by the serous diarrhea, probably due to a temporary hypersecretion. The substernal distress may at times amount to an actual pain, and may be the result of a reflex from the left brachial neuritis. When the pain occurs in the back it may be due to a colonic distention or a probable neuritic involvement of some of the nerves supplying the area. It may also be from diaphragmatic irritation due to upward pressure of a much engorged liver.

Physical examination of the patients should be thorough. The patient's chest and abdomen should be bared, so that inspection may be easy. With the patient prone, normally the abdomen drops a little or considerably below the level of the rib line, but in this type of case one generally finds the abdomen either level with or rounding up above the rib level. In some cases this is much exaggerated and is pathognomonic of a hepatic engorgement, as is not likely to be found except in cases of dropsy or maligancy. In a particularly thin and spare individual one is struck at once by the abdominal prom-

inence and may consider it to be a fair evidence of what will be found. Palpation and percussion will confirm one's suspicions, but for positive evidence for diagnosis I follow up and check up my findings by the aid of an x ray study of both the heart and liver, having measurements made of a uniform type from recognized landmarks.

Prognosis is a matter of the individual case, depending upon the point to which the case has advanced. Early conditions without marked organic changes in the myocardium are usually favorable, but in advanced cases, such as have been cited, one may always look for an unfavorable result, although in some individuals it is surprising how even these respond to the proper treatment. If one finds a fair amount of improvement after two or three weeks of treatment, it may be safe to offer a hope of an ultimate good result, even though it may not mean more than an extension of life under more comfortable circumstances.

TREATMENT

Treatment will vary in individual cases, although we may lay down certain fundamental principles or lines. Recognizing that circulatory stasis is the underlying feature, we must relieve this before we can hope for a betterment. In this diathermy plays the leading rôle. We must apply this in fairly large doses and for considerable periods of time daily, if we hope for immediate effects. Nothing under a half hour, preferably more, should be the rule, and this applies particularly when the patient is stout. Except in cases with considerable hypertension, we usually follow up with the use of the static wave current with a slow long spark, so that contractions will be marked, thereby avoiding the discomfort or pain produced by a collection of gas that usually follows the shorter and quicker spark. The next step is by the use of mechanical vibration. To tone the myocardium we vibrate the interspaces of the seventh cervical and first dorsal vertebræ for one minute to one and a half minutes as judgment dictates. As routine practice the interspaces of the second to eighth dorsals are also vibrated, doing this from above downward and from side to side with moderate pressure.

Many cases require particular attention to the myocardium, particularly those that show marked dilatation of the heart and aorta. These receive diathermy given in the usual careful manner with properly placed electrodes with a moderate amount of current for from fifteen to twenty minutes, using care in starting and shutting off the current. Many cases of the earlier type will respond to relief of the hepatic engorgement, which is shown by a receding of the cardiac and aortic dilatation with the improvement in the liver size. These changes may be noted by fluoroscope or photographs, and I have seen this happen repeatedly without any applications to the heart. For myocardial insufficiency diathermy is usually advisable, and it is now the uniform practice to give this in all cases as a safeguard.

Those cases with marked hypertension usually require in addition a series of autocondensation treatments. This is preferably given in small doses about three or four hundred milliamperes for fifteen to twenty minutes, the patient reclining upon a couch for the purpose with a thick dielectric. This latter treatment may be omitted when conditions improve. Some obese patients with ptoses may require abdominal supports for a time or until relieved by the other measures. These patients usually suffer from intestinal stasis and, when otherwise suitable, the galvanic sinusoidal current may be used for correction of this condition.

We also must not lose sight of all of those measures that we usually command for all metabolic disturbances, such as diet, properly prescribed exercises, rest, sunlight and all else that promotes a betterment of the body, they all play important rôles in the general plan. As diet is of importance we must supervise it carefully and prescribe the correct food stuffs and advise against too great quantities of any kind, as quantity plays an important part. Attacks of "indigestion" seem often to precede a disastrous outcome of this condition. Too much liquid must be advised against also, as has been the rule in all heart conditions. Moderation in all things is a good rule to work with and go by.

Rest at stated intervals must be insisted upon. It is usually prescribed after meals, particularly after the midday meal. This may be for only short periods of time, fifteen minutes often sufficing, but it should be adhered to strictly. There is no objection to other rest periods when possible to arrange for them.

Exercise, while important from all viewpoints, must be carefully prescribed according to individual needs. Walking is about the best form at first, and this should be graduated so that the patient will not become unduly tired. Never allow enough to produce as much as a suggestion of dyspnea.

Patients suffering from this syndrome often are prone to mental depression, and naturally need encouragement, and this will add much to their chances of improvement. A little study of the patient's psychological side will help materially toward a betterment, if the knowledge thus gained is used judiciously. By a study of the case from this as well as other points of view, we gain a better hold upon the patient and more readily secure his faith and cooperation. Optimism upon the part of the physician helps materially and this, together with plenty of patience and perseverance, will often determine the result.

CONCLUSIONS

To sum up, the real object of this paper is to call attention to the fallacy of the statement often made, that hepatic engorgement is the result of cardiac disease. From the studies made by me in a large series of cases, together with the explanations given in this paper, I feel that the reverse is the actual truth, a reversal of the commonly accepted statement, which means that the cardiac dilatation is the result of the hepatic engorgement. These studies have been in part from cases in which it was possible to examine the heart and liver prior to development of symptoms and to follow up subsequently as in the case reported. It is a misfortune that all cases cannot be seen early, thereby saving much suffering. The subject is a most important one, and I trust that it will incite to more study of these cases in the future by all who are interested, and thus help to establish my contentions.

REFERENCE

1. Starling: *Human Physiology.*

Practical Therapeutics

TRYPARSAMIDE IN NEUROSYPHILIS*

HERMAN P. HYDER, M.D.
Washington, D. C.

(*Continued from page 477*)

CASE X.—This patient was seen by me in consultation late in the summer of 1923. He was badly deteriorated at that time and it had been necessary for him to give up a good position that he had held for several years. His relatives were advised to have him hospitalized. However, they were reluctant and he was not committed here until late in the year. This is a deteriorated type of general paresis. November 21, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	14
Gold sol.	5555544400.

He was given eight treatments of tryparsamide at weekly intervals, alternating with nine intermuscular injections of salicylate of mercury. On April 9, 1924, his serology showed:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	12
Gold sol.	5554432000.

This patient was again placed on treatment, tryparsamide alone. After he had received six injections his treatments were discontinued on account of his weakened condition. He died shortly after the treatments were stopped.

This was a case in which the patient was so much deteriorated, both mentally and physically, that you would hardly expect any kind of response to any kind of treatment, and he was placed on tryparsamide only, at the request of his family physician.

CASE XI.—This patient was thirty-six years of age when admitted to this hospital on February 7, 1924. He showed mental and physical deterioration, ataxic gait, muscular twitching of face and legs. Insight was lacking and his judgment was poor. Diagnosis, general paresis. His serology on February 13, 1924, was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	54
Gold sol.	5555543210.

His first course of treatments consisted of nine intravenous injections of tryparsamide and nine intermuscular injections of mercuric salicylate. His serology on June 18, 1924, resulted as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	10
Gold sol.	5555432100.

He was now given thirteen treatments of tryparsamide and took mercury by inunction, with the following serological results October 10, 1924:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	8
Gold sol.	5555543210.

*This paper was read before the American Congress on Internal Medicine, March 9 to 14, 1925, at Washington, D. C.

While this patient's serology showed but little change other than the decrease in the number of cells, he has shown a great response from a clinical standpoint.

CASE XII.—Diagnosis, general paresis. This patient was thirty-six years old when admitted here. He gave a history of chancre in 1920, with a short period intervening before the onset of paresis. He was confused and deteriorated mentally; physically his condition was fair. On October 10, 1924, his blood and spinal fluid showed:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	115
Gold sol.	5543210000.

He was given eight treatments of tryparsamide and nine treatments of mercury. His serology on March 12, 1924, showed as follows:

Wassermann, blood	3 plus
Wassermann, spinal fluid, plus in doubles, 4 plus in quadruples.	
Globulin	Neg.
Cells per c.mm.	5
Gold sol.	Normal curve

He was given ten treatments of tryparsamide without mercury and his serology was again taken December 12, 1924, as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid, Neg in singles and doubles, 2 plus in quadruples.	
Globulin	Neg.
Cells per c.mm.	4
Gold sol.	Normal curve

Here is a patient whose serology improved markedly, while his clinical manifestations did not change so much; however, he did improve mentally.

CASE XIII.—Diagnosis, general paresis. This patient was admitted to this hospital December 15, 1923, aged thirty-six years. He was euphoric and unstable mentally, showing a speech defect with symptoms of a deteriorated type of paresis. On March 12, 1924, his serology was as follows:

Wassermann, blood	3 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	8
Gold sol.	3321000000.

The patient was given eight treatments of tryparsamide and nine treatments of mercury. On September 2, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	Neg.
Cells per c.mm.	3
Gold sol.	5554321000.

He was again put on treatment. When seven treatments had been given they were discontinued on account of patient's failing condition. He died a short time thereafter.

CASE XIV.—Diagnosis, cerebral syphilis. Admitted March 20, 1923. He was suffering from word aphasia, could speak only a few simple words. He was thirty-one years old and gave a history of chancre 1917. He still showed residue of facial palsy, right side. Physically he was in fair condition. On May 28, 1923, his serology showed as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	80
Gold sol.	3321000000.

He was given ten treatments of tryparsamide intravenously and, at the same time, took mercury by inunction. On September 18, 1924, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm	8
Gold sol.	3321000000.

Now he had another ten treatments of tryparsamide, also mercury by inunction. On January 13, 1925, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	3 plus
Cells per c.mm	6
Gold sol	5554321000.

This patient is in good condition from a clinical viewpoint; his aphasia has improved and he shows but little trace of his old facial lesion.

Case XV.—Diagnosis, general paresis. This patient was admitted in September, 1913, aged thirty-three. He was undernourished and weak physically, being confused, showing loss of memory and depression. On October 31, 1923, before being placed on treatment, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm	12
Gold sol.	5555432100.

He was given eight treatments of tryparsamide and nine injections of mercury. On March 12, 1924, his blood and spinal fluid showed:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	5
Gold sol.	Normal curve

He was again given tryparsamide, receiving fourteen doses, with four injections of salicylate of mercury, alternating with tryparsamide. During the latter part of this course mercury was given by inunction. On December 12, 1924, his serology showed:

Wassermann, blood	2 plus
Wassermann, spinal fluid, Neg. in singles and doubles, 4 plus in quadruples.	
Globulin	4 plus
Cells per c.mm	10
Gold sol.	3344321000.

This patient has improved wonderfully clinically. He has become stabilized and reliable. His general reactions are such as leads one to believe that his mentality is on a par with that existing previous to the onset of his illness.

Case XVI.—Diagnosis, general paresis. He was forty-one years old when admitted to this hospital. He gave a history of chancre, 1903. He was disturbed and excited mentally and poorly nourished physically. On June 18, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm	15
Gold sol.	5554321000.

He was given ten treatments of tryparsamide and, on September 9, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid, Neg. in singles, 4 plus in doubles and quadruples.	
Globulin	Neg.
Cells per c.mm	6
Gold sol.	4321000000.

Now he was given eleven treatments of tryparsamide; during the latter five weeks of this course he had five injections of mercury. On January 13, 1925, his serology was taken and showed as follows:

Wassermann, blood	Neg.
Wassermann, spinal fluid	2 plus
Globulin	Neg.
Cells per c.mm.	5
Gold sol.	3321100000.

This patient was rather difficult to manage and showed but little desire to cooperate when treatment was instituted. At present he is in good condition physically, well nourished, and he has made a good mental adjustment, being cooperative and anxious to have his treatments continued.

Case XVII.—Diagnosis, taboparesis. This patient was twenty-nine years old when admitted in March, 1924. He gave a history of chancre, 1919. He was euphoric, expansive and somewhat confused. He complained of muscular pains especially in his lower limbs. He was fairly well nourished. This patient's whole treatments consisted of twenty-one doses of tryparsamide, nine injections of mercury, also mercury by inunction. Before treatment was begun on April 3, 1924, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	39
Gold sol.	5555432100.

On June 18, 1924:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	10
Gold sol.	5555432100.

On August 23, 1924:

Wassermann, blood	plus
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	7
Gold sol.	5544321000.

On December 13, 1924:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	11
Gold sol.	5554421000.

This patient appeared to improve rapidly for a time, then his condition became stationary. Taken as a whole there was considerable improvement clinically.

Case XVIII.—Diagnosis, taboparesis. This patient does not give any history of infection. He states he did not know he had syphilis until 1922. He is now thirty-six years old. Mentally he is clear, some euphoria is present. His gait is ataxic. He has spastic condition of the lower limbs, with incoordination marked. On November 21, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	3 plus
Cells per c.mm.	27
Gold sol.	5555542000.

He was given nine treatments of tryparsamide and ten treatments of mercury. On March 26, 1924, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	10
Gold sol.	5555420000.

He now received eight treatments of tryparsamide and nine treatments of mercury. On July 9, 1924, his serology was again taken:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	6
Gold sol.	5443200000.

(To be concluded)

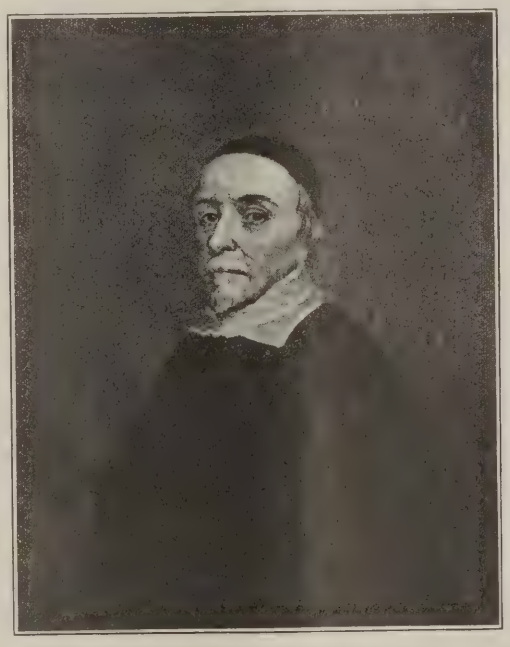
Historical Medicine

Contributions to the Science of Medicine

William Harvey

Scientific discoveries are the result of the researches of various men of keen intellect, sometimes of genius, frequently covering long periods. It is true that William Harvey discovered the circulation of the blood, but a long roll of other workers, preeminent among whom was that supreme anatomist, Vesalius, had paved the way for Harvey's triumph. This does not detract from Harvey's glory for, as just stated, almost all great scientific discoveries have followed a similar course. However, a history of the discovery will be outside the scope of this sketch as well as being superfluous. All medical men are acquainted with the salient points.

The object of this memoir is to present the important phases of Harvey's life, as far as those are known. Aubrey was his historian, but like most of the historians of the time in which Harvey lived, he told the tale in a gossiping manner. Pepys and Evelyn and Defoe, although infinitely better writers than Aubrey, wrote in a somewhat similar, discursive, chatty way, while it is said that Defoe in his history of the plague of London relied more on his imagination than on facts. In order to give as accurate a narration of Harvey's life as possible, the excellent contribution to the *Masters of Medicine Series,* on Harvey, by Sir D'Arcy Power, has been chiefly consulted.



WILLIAM HARVEY

Thomas Harvey, the father of William, was a respectable citizen of Folkestone, which is situated on the coast some sixteen miles from the cathedral city of Canterbury. Indeed, Thomas Harvey was a jurat, or alderman of Folkestone where in 1600 he filled the office of mayor. He was a man of substance and appears to have been a shrewd business man of more than ordinary intelligence and judgment. He was married twice, his first wife dying the year after marriage. William was the eldest of the second family or, as Fuller quaintly expresses it, the eldest of "a week of sons." He was born on April 1, 1578. He had six brothers and two sisters. All his brothers but one were city merchants and amassed much money. The most successful was Eliab, and to his watchful care William owed much of his material wealth, for Aubrey says that "William Harvey took no manner of care about his worldly concerns, but his brother, Eliab, who was a very wise and prudent manager, ordered all not only faithfully, but better than he could have done for himself." Eliab had estates in Roehampton in Surrey and at Chigwell in Essex; he also had a large town house. He built the "Harvey Mortuary Chapel with the outer vault below it" in Hempstead Church near Saffron Walden. Here he buried his brother, William, in 1657 and was himself buried in 1661.

Little is known of the early life of William Harvey. In 1588, at the age of ten, he went to the King's School, Canterbury, where he remained for five years. He then entered, as an ordinary student, Caius College, Cambridge, a college which had been refounded thirty-six years before Harvey's entry by Dr. Keys of Norwich and which was then as now regarded as the college for those who intended to study medicine. In 1597 Harvey graduated as Bachelor of Arts of Cambridge. At this time the great North Italian Universities of Bologna, Padua, Pisa and Pavia were the Meccas for those who desired to study mathematics, law or medicine. Harvey chose Padua which was specially renowned for its anatomical school, rendered famous by the investigations and discoveries of Vesalius and by the work of his successor, Fabricius. Perhaps another reason why Harvey made choice of Padua was, because on account of the tolerance with which Protestant students were treated, a large number of its medical and law students were drawn from England and Scotland and other Protestant countries. University education in those days was cosmopolitan and the universities of Paris, Montpellier and Northern Italy attracted students from all countries. Not much is known of Harvey's career at Padua except that he was a close friend of Fabricius, who at that time was engaged in perfecting his knowledge of the valves of the veins. It seems more than likely that much of Harvey's work was a continuation and amplification of that done by Fabricius. Harvey graduated as Doctor of Medicine at Padua in 1602. His diploma, a very eulogistic one, came into the hands of Dr. Osmond Beauvoir, head master of the King's School, Canterbury, by whom it was presented to the College of Physicians of London on September 30, 1766. This diploma is dated April 25, 1602, and confers on Har-

vey the degree of Doctor of Physic, with leave to practise and teach arts and medicine in every land and seat of learning. It further recites that "he had conducted himself so wonderfully well in the examination, and had shown such skill, memory, and learning that he had far surpassed even the great hopes which his examiners had formed of him. They decided, therefore, that he was skilful, expert, and most efficiently qualified both in arts and medicine, and to this they put their hands unanimously, willingly, with complete agreement, and unhesitatingly.

After obtaining his degree at Padua he must have returned to England at once, as he obtained the degree of Doctor of Medicine from the University of Cambridge in the same year. Soon after his return Harvey seems to have taken a house in London and wasted no time in attaching himself to the College of Physicians. He had qualified himself for admittance to the College of Physicians by taking the M.D. of Cambridge—admission to the college was practically confined to graduates in medicine of the English universities—and was admitted a candidate of the College of Physicians on October 5, 1604, in the stone house once Linacre's in Knightrider Street, the candidates being the members or commonalty of the college from whom its Fellows were chosen.

A few weeks after his admission Harvey married a daughter of Dr. Lancelot Browne, who had been physician to Queen Elizabeth and to James I. Nothing is known as to how Harvey passed the first few years of his married life.

He was elected a Fellow of the College of Physicians, June 5, 1607, and almost immediately sought to attach himself to St. Bartholomew's Hospital. On October 14, 1609, he was elected physician to St. Bartholomew's Hospital. In 1615 William Harvey was appointed Lumleian lecturer. The Lumleian Lecture, founded by Lord Lumley and Dr. Caldwell in 1582, was a surgery lecture established at the cost of forty pounds a year. The manuscript notes of Harvey's first course of lectures are now in the British Museum. In those days the lectures were given with great ceremony. His first Lumleian lecture was delivered on Tuesday, April 16, 1616, and on the following Tuesday Shakespeare died at Stratford-on-Avon.

Harvey continued his Lumleian Lectures year by year, but nothing more is known of them until 1627 when he delivered a series of lectures upon the anatomy and physiology of the human body, more especially of the arm and leg, with a description of the veins, arteries and nerves of these parts.

In 1618, he was appointed Physician Extraordinary to James I, and in 1631 Charles I appointed him Physician in Ordinary and remained his friend through life. Among his patients was the great Lord Chancellor, always a weak and ailing man, and somewhat of a hypochondriac. Curious to relate there was a lack of sympathy between these two distinguished men. In fact, Harvey evinced a contempt for Bacon's philosophy.

Harvey early attained high office in the College of Physicians. In 1629 he received the commands of the King to accompany the Duke of Lennox who was sent to travel abroad. He was nearly fifty-two years old at the time. In 1632 he was again in England and there is no doubt that at this time and throughout his life Harvey practised every branch of his profession. While it is evident that in the first place he was a physician, that he was a surgeon, too, is shown by the fact that in his will be bequeathed to Dr. Scarborough "his silver instruments of surgery." In 1636 he accompanied Lord Arundel, a friend, who was sent to Vienna as Ambassador Extraordinary to the Emperor Ferdinand. He used the opportunity to make the acquaintance of the leading scientific men in Germany. Then came the civil war and Harvey accompanied Charles in his campaign and was actually under fire at the battle of Edgehill where he probably had his first opportunity of treating gunshot wounds. On October 29, 1642, Charles entered Oxford and of course Harvey with him.

During the next year or two Harvey lived quietly at Oxford making dissections and carrying on professional work among the courtiers who thronged the city. The surrender of Oxford in 1645 marks the period of Harvey's severance from the Court and of his practical retirement from public life. He was now sixty-eight, a martyr to gout. Childless, and suffering from heavy bereavements. The bond of friendship which had always marked members of the Harvey family was now exhibited in a striking manner. The eldest brother who had lost his lares and penates at Whitehall and Oxford was a welcome guest for the rest of his life in the houses of his younger brothers. He stayed chiefly at the town house of his brother Eliab or sometimes at his country houses. Occasionally Harvey spent a part of his time with his brother Daniel in the suburban village of Lambeth.

Some curious and amusing details of his habits at this time have been handed down. For example, Aubrey says, "He was much and often troubled with the gout and his way of cure was thus: He would sit with his leg bare, though it were a frost on the leads of Cockaine House, put it into a pail of water until he was almost dead with cold, then betake himself to his stove, and so 'twas gone. He had other harmless little eccentricities, such as walking in the fields in the morning combing his hair. Sitting down exactly at the time he had appointed for dinner whether the company was come or not. That his salt cellar was always filled with sugar which he used to eat instead of salt. He was also very contemplative and was wont to frequent the leads of Cockaine House, which belonged to his brother Eliab, having his several stations in regard to the sun and wind for the indulgence of his fancy; whilst at the house at Combe in Surrey he had caves made in the ground in which he delighted in the summer time to meditate."

Harvey possessed great charm of personality. Beloved by his family and honored by all, the old man went to his grave amid the genuine grief of all who knew him. He died at Roehampton in the house of his brother Eliab on June 3, 1657. It would appear from the account given by Aubrey that Harvey died of a cerebral hemorrhage from vessels long injured by gout and situated rather at the base or internal parts of the brain than in the frontal lobes. Most probably the left Sylvian artery gave way, leading at first to a slight extravasation of blood, which

rapidly increased in quantity until it overwhelmed the brain.

The body was brought to London, where it seems to have been placed in Cockaine House. Here it rested many days, because though Harvey died on June 3d, it was not until June 25th that the Fellows of the College of Physicians received a notice requesting them clothed in their gowns to attend the funeral on the following day. In the meantime Eliab as his brother's executor had determined that Harvey should be buried at Hempstead in Essex, where Eliab had erected in 1655 "the Harvey Chapel" on the north side of the church and also built an outer vault beneath it as a place of sepulchre for his family. The funeral procession started from London June 26, 1657, and was followed far beyond the city walls by a large number of the Fellows of the College of Physicians, many of whom must afterwards have hurried back to Westminster Hall, where on the same day Cromwell, with the greatest ceremony and with all the pomp of circumstance was inaugurated Lord Protector for the second time and invested with kingly power. Harvey was laid in the outer chapel between the bodies of two nieces who were the only occupants of the vault, and like them he was "lapt in lead," coffinless, while upon his breast was placed in great letters his name, his title, the date of his death and his age. On St. Luke's day, 1883, the leaden case containing Harvey's remains was carried reverently from the vault by eight Fellows of the College of Physicians and immediately deposited in a marble sarcophagus built for the purpose in the Harvey Chapel of Hempstead Church, in the presence of the president, the office bearers, and many Fellows of the Royal College of Physicians.

At the age of eighty-seven years the appearance of Harvey is thus described: "A man of lowest stature, roundfaced, with a complexion like the wainscot; his eyes small, round, very black and full of spirit; his hair as black as a raven and curling; rapid in his utterance, choleric, given to gesture, and used when in discourse with anyone, to play unconsciously with the handle of the small dagger he wore by his side."

Unfortunately, the records of many years of careful work done by Harvey were destroyed or scattered by the violence of the times in which he lived. But his liber aureus *Exercitatio anatomica de motu cordis et sanguinis in animalibus* has been providentially preserved. It may be said that this book was issued from the press of William Fitzier of Frankfort in the year 1621 and contains the matured account of the circulation of the blood. Harvey also wrote a treatise on development which is extant and which shows the range of Harvey's mind filled with the knowledge of ancient philosophy, but animated by the experimental spirit of modern science. Harvey may be classed among the discoverers who were creative geniuses. He possessed the boundless inquisitiveness of the discoverer but relied on facts and distrusted imagination. He was averse to theories and pinned his faith to what he could see with his own eyes and comprehended by his own intelligence. Harvey was a cultured and polished man, resembling in this respect his great predecessor Vesalius.

He was a contrast, in many essentials, to his much younger contemporary Thomas Sydenham. One was a devoted royalist while the other was a determined Cromwell man. Harvey was a creative genius while Sydenham was the very embodiment of commonsense. Harvey, although he practised in all branches of medicine, was fundamentally an investigator and was engrossed in experimental science. Sydenham was a practitioner of medicine and helped to revolutionize treatment. Both Harvey and Sydenham had true vision and the initiative to found the principles of approach and to do what they set out to do. Harvey's was the higher form of genius and he takes rank with the very great ones of the earth. Sydenham triumphed through character and laid the foundation of clinical medicine.

Under the Stuarts and the Protectorate of Oliver Cromwell there lived in England some of the shining lights of the medical profession, namely, Harvey, Wiseman, Locke and Sydenham, and that extraordinary genius Boyle the chemist. Indeed the Elizabethan and Stuart periods were prolific of gifted men, among whom Harvey takes his place as one of the brightest ornaments of the medical profession of any age.

Whether Harvey encountered the proverbial fate of pioneers and prophets is uncertain. According to Dr. Munk he had lived to see his great discovery of the circulation of the blood universally accepted as a canon in most of the medical schools of Europe and he is said by Hobbes to have been "the only one that conquered envy in his lifetime and saw his new doctrine everywhere established." On the other hand, in the *Life of William Harvey,* by R. B. Hervey Wyatt, published recently, it is stated that Harvey's contemporaries and fellow practitioners refused to be convinced of the truth it had been his life work to demonstrate. The news of his wonderful discovery fell on deaf ears. It may have been the case of a prophet having no honor in his own country, as it seems certain that the learned scientific men in Europe accepted his views concerning the circulation without reserve. It must be borne in mind that in England at the time scientific medicine was at a low ebb and that there were but few of its medical men who would be able to appreciate intelligently the significance of Harvey's discovery. As a rule their anatomical knowledge was on a level with or considerably below that of Aristotle or Galen while their methods of treatment were almost wholly empirical and fell far below those of the Greek school.

It seems to be very probable that Harvey's discovery was recognized at its true worth by the learned professors of medicine of the European schools, and by a very few in England, but of its opponents there was none who had sufficient knowledge to combat it on really scientific grounds. There are not many revolutionary discoveries which are universally acclaimed at once, for the reason that it needs the acid test of time to establish them. Harvey seems to have been more fortunate in this respect than the majority of prophets and pioneers. Harvey laid the foundation of modern medicine by the discovery of the circulation of the blood and Sydenham at about the same time laid the foundation of sound treatment. Both builded better than they knew.

Editorial Articles

THE EFFECTIVENESS OF RADIUM

Radium seems to be growing in favor as a curative and remedial agent. A drawback to its use has been always the scarcity of the substance, but this handicap has been removed to some extent by the bottling of radium in large quantities which permits of its administration on a far more extended scale than formerly. Recently Mr. Hayward Pinch, the medical superintendent of the Radium Institute in London, assisted by Dr. Moltram, the director of the pathological laboratory and Mr. W. L. S. Alton, the director of the chemicophysical laboratory, have given to the world in a volume entitled *A Clinical Index of Radium Therapy,* a summary of the results of fourteen years' effort in this institute.

In that period 14,500 patients have been dealt with, and 103,000 treatments with radium given. The book discusses the treatment of a large number of diseases and demonstrates how wide is the use of radium in therapeutics. The most important part of the book, however, is that devoted to a consideration of the value of radium in the control of cancer. Naturally enthusiastic statements in this direction are tabooed and it is said that while symptoms are often relieved and life prolonged in cases of malignant disease, it would be extremely unwise to predict that any or all of them would remain free from recurrence indefinitely.

It is further pointed out that the repute of radium has suffered severely from the irrational enthusiasm and unthinking expectation which so often attend the appearance of a new remedy. None the less it is impossible to deny that radium is a therapeutic agent of great, and in some respects of unique, power. The hope is expressed that with increased knowledge and improved technic the time will come when the word "cure" may be used deliberately and justifiably with regard to the radium treatment of a constantly increasing number of cases of malignant disease.

It is not suggested as yet that radium should be the treatment of choice in operable cancer cases. On the other hand, when operation has become impossible, its use is entirely justified. For example, in cases of cancer of the lip "great benefit is very often obtained in inoperable cases, the progress of the disease being arrested, ulceration healed, and hemorrhage and discharge abolished." It is stated that in one form of epithelioma of the cheek, the method of burying tubes of radium in the diseased area will almost invariably bring about the complete disappearance of the lesion, which rarely, if ever, recurs.

Cancer of the tongue which used to be the *bête noire* of the radiologist is now, with improved technic and increasing clinical experience, giving more encouraging results. Internal cancers present exceedingly difficult problems, the greatest, perhaps, of which is the necessity for securing proper irradiation of the growth. The action of radium irradiation upon any living cell, if used long enough and of the requisite degree of intensity, is first, increase of activity, then arrest of activity, and finally degeneration and destruction. Normal cells and pathological cells, however, behave differently when under the action of radium. Tumor cells are stimulated more easily, their vitality is inhibited more quickly and degeneration occurs more rapidly.

Therefore the problem before the radiologist is mainly one of dose and of period of irradiation. Successful radium treatment means that the dose must be as accurate as possible and the exposure extending over a sufficient length of time to destroy the pathological cells without appreciably affecting the functions and vitality of the normal ones, thus enabling repair to be accomplished satisfactorily. An insufficient dose may possibly act as a stimulus causing increased growth, while an overdose may destroy healthy cells.

Growing cells are most amenable to treatment by radium and in consequence certain quick growing tumors respond more rapidly to treatment than those which grow more slowly. Experience has taught that it is wisest to give a maximum dose at the first exposure to radium. If further treatment is required, subsequent doses must be smaller. As the sensitiveness of various types of tumor cells to radium differs widely it is possible to make a rough classification on this basis. The radiologist by reason of accumulated knowledge is now able to work with a considerable amount of scientific precision. He knows, to some extent, how the various tissues of the body may be expected to react to the different radium rays, and has quite a clear idea of the variations of reaction of abnormal and normal tissue. This knowledge is essential and only those who possess it should attempt to use radium for therapeutic purposes.

The science of radiology, while out of its swaddling clothes, has hardly reached adolescence and is still somewhat in the experimental stages in spite of the fact that some of its achievements have been signal triumphs and that its future is full of promise. In the use of radium, as in the use of any therapeutic agent whatever, the personal equation must be studied and taken into consideration. Individuals of

a highly neurotic temperament are more susceptible to the effects of radium than those of a phlegmatic type. Persons who exhibit a high degree of susceptibility to the violet rays of the sun are liable to a darkening of the skin some months after treatment with radium.

The book of Hayward Pinch and his colleagues is a stimulating account of pioneer work in radium and of the progress made during fourteen years. Knowledge is not accurate or precise, but advance is being made steadily in that direction and the outlook is encouraging. The value of the book chiefly consists in the fact that it is a restrained record of work done scientifically and conscientiously.

SPRING MEDICINE

Most of our hygiene and more of our medicine is still in the realm of speculation. The following, if admittedly speculative, suggestions may not miss the mark more than much which is set down with more assumption of positive authority. Most of science is the result of putting two and two (often very small twos) together, and possibly the comparison of some very large figures may be worth while.

The common diseases—the diseases which affect everybody or nearly everybody (and which being so near at home we hardly consider diseases when compared with Addison's, acromegaly or other rare and big named ones)—are carious teeth and constipation. Nearly a hundred per cent. of us suffer from the former, and at least half as many have found our way with them to the tinkerer of bad teeth—the dentist—nearly a hundred per cent. of us are bothered by the latter at some time and to some extent, and half of us find our way to the opener of bowels—the physician. Let us stand far enough away and consider, and we must all admit that these are the outstanding abnormal conditions of civilized man. They may not kill but they curse us continually. They are, however, both symptoms. The cause is known beyond cavil; in both cases the wrong quantity and quality of food, or bad nutrition. The wild animal has neither the one nor the other of these disorders, nor has he them in captivity if he has wise keepers.

But let us go deeper. If the materials for teeth are bad, will not other tissues receive bad stuff for their making and upkeep. We know that more than mere bone is affected in rickets and may not constipation also bring about effects on tissues? There is evidence which the assertions of recent experimenters do not refute, that it does. We know that colonic bacteria must flourish under the circumstances and that defenses against these, locally and generally, must be much overworked at the time. There is a tendency to discredit Metchnikoff's theory of premature old age, but was there not more truth in it than even Metchnikoff dreamed? It may do little good to remove the great bowel, but it may make all the difference in the world what and how much it contains, especially in the superfed.

Focal infection now holds the centre of the stage, and we are blaming teeth, tonsils, sinuses, appendices—all the nooks and crannies where bacteria may congregate—but neither teeth, tonsils nor any other such structure is directly and primarily to blame for their focal infection. Putting two and two together, isn't the blood, by which means alone such focal infection can occur or be kept alive, at fault, and, back of the blood, its source—the food?

The evidence from the spring medicine habit fits in here, for "spring medicines" (through their gentle action on the colon) really clean the blood, for the time, from stuff accumulated, the results of a left-over, too vigorous, cold weather appetite. Our ancestors knew a few things in practice, if not in theory, and even bleeding may not have been a bad thing in a day when they ate much more for pleasure than we do.

How can a tissue—dental, tonsillar, or other—resist disease when it is not supplied with the right materials or is deluged daily with wrong materials? And why should not cells go insane on the subject of reproduction and become cancerous under such circumstances? There is more proof for such a theory than for any other that has been advanced.

STATE MEDICINE?

There is a feeling amounting almost to apprehension among certain groups engaged in the curative branch of medicine that the sanitary profession is invading the province of the practitioner and in so doing is inflicting damage upon the pocketbooks of those engaged in the remediation of disease. It is barely possible that this may be true in certain isolated instances, but the general tendency of the public health movement is to be an aid to the practitioner. To be sure, it is the aim of preventive medicine to reduce, and, so far as is possible, to prevent disease. It is realized that it is far better for the community to be maintained in a state of health rather than to be cobbled up from time to time. This idea, however, is a long way from accomplishment and while reduction in the preventable communicable diseases has deprived the practitioner of a certain amount of income, this has more than been compensated for by the increase in physical examinations and in the early recourse to medical service which has been brought about by the public health movement. Similarly, there has been a tremendous increase in the number of operations for the removal of tonsils and adenoids and there are far more early operations for the re-

moval of cancerous growths today than there were ten years ago. Antituberculosis work has stimulated physical examinations and early treatment, and many patients are now consulting the physician who, hitherto, would probably not have gone to him at all. It has also been stated that the sanitarian is changing medicine into state medicine and that one of these days the public will be entitled to medical treatment without fees, just as today it is entitled to education in the public schools without paying tuition. This is not a matter which falls within the province of preventive medicine. There are adequate agencies to see to it that only the qualified practise medicine and so long as the public receives good medical attention, preventive medicine should be, and is, satisfied. If the public is learning to prefer the public clinic to the private practitioner, it is not the fault of the sanitarian. As a matter of fact, is it not the practitioner, who, by giving gratuitous service in free clinics, is rapidly teaching the public to prefer free public medical service and hence is bringing state medicine into being?

GASTROINTESTINAL TROUBLES AND CANCER

A great deal of discussion, some of it somewhat acid in character, has taken and is taking place with regard to the causation of cancer. No one specific cause of malignant tumors has been discovered yet nor does it seem likely that any such discovery will be made in the near future.

One of the best contributions which has been made to the subject recently, is in the form of a paper entitled The Cause or Causes of Cancer, read by Dr. Adam H. Wright, of Toronto, before the meeting of the American Public Health Association held in Detroit on October 22, 1924, and published in the *Medical Press and Circular*, November 5, 1924. This paper is termed one of the best, deliberately and mainly for the reason that it considers a much debated and disputed matter from the viewpoint of common sense. Dealing with the relationship of gastrointestinal disorders, and of chronic intestinal stasis in particular, to cancer, this article is the concentrated essence of common sense. The author does not state boldly that chronic intestinal stasis is a cause of cancer but only suggests that it may be a prominent factor in its causation and explains why he thinks this outcome is possible. In the first place, he points out that cancer is largely, if not essentially, a disease of civilization and is almost unknown among those who lead primitive lives. Of those he quotes in support of this contention is Dr. Hindhede of the Danish Bureau for Nutrition Research in Copenhagen, whose strong views on this aspect of the situation were given by a well known medical writer in the *New Statesman* of September 27, 1924.

Dr. Hindhede is an uncompromising adherent of the belief that cancer is a disease of civilization and supplies potent testimony to this effect. As for Wright's argument that chronic intestinal stasis, one of the evil results of civilization, may be regarded as an important factor in the causation of cancer attention is drawn to the fact that long continued irritation is allowed to be a cause of cancer. Chronic intestinal stasis brings about various conditions of irritation in the intestinal tract. And again it is affirmed that prolonged intestinal stasis, by producing a toxemia which in the course of time invades the whole system, so weakens the defensive powers of the body, that disease, cancer for instance, gains the upper hand. It is almost an aphorism that cancer never affects a healthy organ. There are then two reasons why chronic intestinal stasis may be a cause of the exciting of cancer, because it provides the foci of irritation and the favorable soil.

Dr. Wright professes himself fully conscious of the truth of the statement that our only reliable means of fighting cancer at the present time is early diagnosis and prompt surgical intervention, but he emphasizes the suggestion that by a more careful diet and by more rational methods of living in other ways than is now customary in civilized countries, the occurrence of cancer may be sometimes, perhaps, frequently avoided. He also states another obvious truth that by following these precepts, even if cancer is not largely prevented, several other ailments or diseases arising from or aggravated by long continued intestinal disorders, mainly marked by chronic constipation, will be nipped in the bud.

Wright takes the stand, that as existing methods of treating cancer are inadequate because cancer is seldom diagnosed, often such diagnosis is impossible, at a stage sufficiently early to make surgical measures successful, he therefore agrees with Sir Arbuthnot Lane that methods for prevention shall be given a trial, as, for example, a more suitable diet and a more healthy mode of living in every respect.

There is little doubt that in the discussions on diet which have been edifying the medical profession and the general public of late too great stress has been laid on the importance of the hypothetical vitamines. It has been asserted by more than one, whose opinions carry weight, that much of the innutritious properties of the ordinary man's diet is due to lack of one or other of the vitamines, that is, to vitamine starvation. This view seems to be owing to lack of proportion of outlook. Other constituents of diet, mineral salts, to wit, are of quite equal importance to the vitamine content, indeed, if the

mineral salts are present in their proper quantities, the vitamines may be left to take care of themselves. As Dr. Wright says, the most deadly evil of civilization, as far as diet is concerned, is overeating and drinking. One point, which few writers on cancer touch on, is as to whether a predisposition or susceptibility to cancer can be inherited. Some individuals, the majority of the population it seems, are immune to cancer. Is there a solid substratum of truth in our grandfathers' views that certain diatheses were transmitted to children by parents or ancestors, and may this hold good to some extent for cancer?

The question of cancer being a disease of civilization is certainly worthy of serious consideration, and Dr. Wright deserves the thanks of the medical profession for dealing with a matter of world wide importance with restraint and logical reasoning combined.

REFORM

The Reverend Charles F. Potter has made a great to do about the handling of psychopathological cases by the psychoanalytical methods. He was especially strong in his remarks concerning the uncontrolled nonmedical analysts. Here his point is fairly well grounded but quite overstressed. He cited as the evidence of wreckage the reports of former neurotic patients who asserted that they had been made worse by analytical treatments and had had to pay for them. No doubt Potter meant well. Perhaps it would have been somewhat better had he investigated more thoroughly. But careful investigation does not seem to go hand in hand with the writing of sensational newspaper reports. Potter's broadside appeared in *The World*. The editors of this paper felt he had gone a bit far, and said so in an editorial which appeared shortly after the publication of Potter's article.

Psychoanalytical procedure, in spite of the fierce opposition which it once excited, is now becoming the accepted method of approach to psychopathological problems. It holds a place in the field of mental therapy analogous to that of surgery in general medicine. It is used most extensively in our great government hospital, St. Elizabeth's, in Washington, D. C., and has been found to be the only available method of approach in many state hospitals for mental diseases. Psychotherapists, who once could see no benefit from analysis, now realize that they can make no progress without a working knowledge of this art. No former method has been as efficient in the entire field of functional disorders.

This editorial is not intended as a defense of psychoanalysis. It concerns the newspaper activities of such men as Potter. He tried to be fair, so fair that he leaned over backward when he admitted that he could not stomach the tirades of the extremist opponents of analysis, and he thought there must be some good in analysis in spite of what they said. He left himself the customary loopholes, yet his article as it stood was misleading and, at best, a piece of cheap newspaper notoriety. Had he been more sincere and less noisy he could have been infinitely more effective, had he gone directly to the medical profession and put his case before them. He would have had a hearing and at the same time got more accurate information. As it is, he exposed himself to ridicule and accomplished nothing.

The reputable analysts are recognized medical men, well trained in the general field of medicine. The medical profession has the matter well in hand. The medical profession would not think of entering into the field of theology, no matter how firmly certain of its members believed that certain tenets held by some religious sect might be false or misleading or even harmful. This matter would be left in the hands of the theologians. Potter no doubt has gone back in his concepts to a remote primitive level, to the time when the medicine man of the tribe served the spiritual and physical needs of the community. That was a long time ago.

No, the medical profession respectfully requests Potter and others similarly minded not to interfere unduly in its affairs. If they feel that they must, let them come to the medical profession to learn a few salient facts and then if they have any complaints to make, let them be made to those who are responsible. Otherwise his sincerity will be doubted. The motives that prompted him will be questioned and his perhaps well meant gesture appear absurd.

THE CENSUS BUREAU'S NEW LIFE TABLES

The United States Abridged Life Tables, 1919-1920, prepared by Elbertie Foudray under the direction of Dr. William H. Davis, have recently been issued by the Census Bureau. Some of the data shown in these tables are of especial interest. In expectation at birth, the decade 1910-1920 shows the same general progress as the preceding decade. Females still have a better expectation than males, and the colored show more improvement than the white. They have about the same expectation at birth that the white had thirty or forty years ago. The figures show that, up to extreme old age, white and colored males have made a steady gain in expectancy; in old age the figures cannot be taken as reliable on account of various difficulties in getting and tabulating available data for that age. In the

case of both sexes and colors the decline in expectation in middle life so noticeable in 1910 has disappeared. This improvement in longevity at mature ages is shown consistently in the male populations of all important States and cities from which data for the two periods have been worked up into life tables.

From 1900 to 1910 there was a tendency for the urban mortality rates to fall more rapidly than the rural. The tables show that the greater decline in mortality in cities has continued during the past ten years. Chicago, New York City, Philadelphia, and Boston all show a greater increase in expectancy than any of the five states tabulated. Although urban rates appear to be falling more rapidly than rural, they are still much higher.

The improvement in expectation at each age noted in the case of males is not so evident in the data for females. Except for expectation at birth, only slight progress would appear to have been made in the past decade, if the years 1919-1920 are taken as representative. Some improvement in the expectation of life for white females may be observed after the thirty-year mark, but the tendencies manifested from 1900 to 1910 have not continued. The expectation for colored females has improved slightly since 1910; but, except for childhood, they have failed to recover the ground lost from 1900 to 1910. This means that the traditional advantage held by females over males in longevity has been considerably reduced.

A phenomenon of these tables, which did not show itself in the previous years tabulated, is the excess of mortality among young adult females. There is a wide variation in these mortality rates, from California and Washington, with no excess at all, to Kentucky with an excess at each age from seventeen to fifty-seven years. At the ages of twenty-two, twenty-seven and thirty-two, the period when the excess is most marked, we find that it is greatest in the Central and Lake States. New England and other Eastern States and also the far Western States have but slight tendency for an excess of the female rate over the male at these ages. This phenomenon is reflected in a number of causes of death, based on the age group 20-24. All causes showed a female excess rate of thirty-one per 100,000 in 1920; but in 1910 the male rate was in excess by seventy-four per 100,000. Violent causes and typhoid fever have only an adventitious relation to the phenomenon. In both the male rates are greatly in excess, and in both there has been a marked decline in the last ten years. On the other hand, there has been an increase in a condition limited to females, namely puerperal causes. Tuberculosis and influenza pneumonia are the two other conditions involved in the female mortality excess in the age group twenty to twenty-four. The reasons for this heavy mortality among young adult females are obscure. The tables only indicate the facts.

CONJUGAL TUBERCULOSIS

Dr. Paul Roussel has recently contributed much to our knowledge of the question of tuberculosis contagion between husband and wife, based on exact statistics. According to Roussel, contagion between husband and wife, even among the working classes, is rare, and occurs only after long cohabitation. In the total statistics it is not over 5.2 per cent., and in open cases 11.56 per cent. On the contrary, in the same families, the children are extremely sensitive to tuberculosis infection, and in the total statistics their minimum proportion is 25.02 per cent., and 37.59 per cent. in open tuberculosis of the parents.

Transmission from husband to wife appears to be by far the most frequent, this fact being due to the particular receptivity of women at the time of pregnancy, puerperium, and lactation. When transmission of the disease between husband and wife does take place, it is mild in over sixty-six per cent. of the cases.

The infrequency of conjugal tuberculosis can be explained by the immunity the mild repeated superinfections confer upon the adult in respect to slight contaminations arising in everyday life. Cases of conjugal contagion rarely represent massive contamination; usually there is predisposition to tuberculosis dependent upon heredity. A delayed marriage may be permitted under certain reserves to patients with socalled cured tuberculosis which has been so for several years. In this respect, we should be always more guarded in the case of women than men, and a union between two tuberculous subjects should never be advised. Conjugal prophylaxis consists of sleeping in separate beds, a discipline of coughing and expectoration, and a wise sexual life, a long interval between pregnancies, and the maintenance of good general health in the healthy conjoint.

Dispensary supervision and social prophylaxis favor the good results obtained by individual effort. In the etiology and prophylaxis of tuberculosis, Dr. Roussel rightly points out that there is a real danger when only the bacillus is considered, as well as only considering the question of soil. The truth is to be found in both theories. Calmette's remark: "No matter how fertile may be the soil it will never grow seeds other than those scattered by the laborer, birds, or winds" can be completed by Vallin's remark that "The soil of the forest of Fontainebleau is strewn with acorns, not one of which will probably ever become an oak tree."

News Items.

New Health Bulletin.—The *Ohio Health News*, a semi-monthly bulletin, is being issued by the Ohio State Department of Health.

Leyden University Anniversary.—The University of Leyden, Holland, recently celebrated the three hundred and fiftieth anniversary of its founding.

Memorial to Doctor Bunnell.—The California Medical Association at its annual meeting in May will unveil a bronze memorial commemorating the naming of the Yosemite Valley by Doctor Bunnell, who, in 1851, as a member of the Mariposa Battalion, was one of the first white men to enter the valley.

Florence Nightingale Memorial Service.—Elaborate services, attended by two thousand nurses representing all nursing organizations of the city, will be held May 17th at the Cathedral of St. John the Divine, New York, to commemorate the memory of Florence Nightingale, and also the nurses who died during the war.

Venereal Disease Control.—The board of health of Salt Lake City, cooperating with the state board of health, has put into effect a rule providing examination of all men and women found under circumstances giving rise to a reasonable suspicion they have a venereal disease, quarantine and enforcement of treatment.

New Federal Hospital.—The establishment of a hospital for the eighty thousand government employees in Washington, is being considered. The institution would be built and maintained with small monthly payments from the salaries of the employees, and the Government would be asked to direct the campaign for funds and manage disbursements.

Supervision of Radio Health Talks.—Through the efforts of the special committee on press and publicity of the Medical Society of the County of New York, a number of the more important broadcasting companies in New York City and Newark have consented to voluntary supervision of all talks on health topics going out from their stations. Such talks will be submitted to the society's representatives for approval. The stations which are cooperating are WEAF, WJY and WJZ, WOR and WNYC.

Broad Street Hospital.—The executive committee of Broad Street Hospital, New York, and its acting president, Dr. William H. Dieffenbach, have issued a statement that the assets of the hospital exceed its liabilities by a sum of upwards of one half million dollars, and that its deficit in operation is that of any hospital operation on a charitable basis, a deficit to be made up by donations from the public and friends of the hospital. With a change in financial management, the present financial stringency is being overcome, and the hospital brought back to its former prosperous condition.

Gifts and Bequests.—Mount Sinai Hospital of New York, has received by the will of the late Mrs. Emma Rosenwald, $100,000, and a contingent interest in the estate.

Kingston General Hospital, Toronto, has been bequeathed $300,000 in the will of the late Charles Sandwith Campbell, a Quebec attorney.

The Greenwich (Conn.) Hospital receives $10,000 under the terms of the will of the late Allen B. Forbes.

Personal.—Dr. Philip R. Lehrman, assistant professor of psychiatry at the New York Post Graduate Medical School and Hospital, has been appointed visiting physician to the Manhattan State Hospital, Ward's Island, to take charge of the psychoanalytical department.

Dr. William Seaman Bainbridge of New York, is delegate from the United States to the third *Congres International de Medicine et de Pharmacie Militaires* recently held in Paris. His reports of the first two congresses, held in Brussels and Rome, respectively, have been published in Washington.

Dr. J. O. Polak, of Brooklyn, spoke before the Flatbush Medical Society on The Medical and Surgical Cervix.

Dr. Amos O. Squire, for fifteen years resident physician at Sing Sing Prison, has been endorsed by the executive committee of the Westchester Republican County Committee for the newly created post of county medical examiner.

Dr. Max Thorek of Chicago has been appointed corresponding member of the Surgical Society of Paris, France, and elected a member of the Academy of Medicine of Torino, Italy.

Banquet of Peoples Hospital.—The annual banquet of the Peoples Hospital given by the board of directors and medical staff was held at the Hotel Biltmore on Saturday, April 18, 1925. A bronze tablet was dedicated in honor of Vahdah Anna McCullough.

American Psychopathological Association.—The American Psychopathological Association will meet in Washington, D. C., May 7th. Papers will be presented by Dr. Alfred M. Barrett, Dr. J. Ramsey Hunt, Dr. L. Pierce Clark, Dr. L. E. Emerson, Dr. Harry S. Sullivan, and Dr. Trigant Burrow.

American Psychoanalytic Association.—The American Psychoanalytic Association will meet May 12th, in Richmond, Virginia. Papers will be presented by Dr. I. H. Coriat, Dr. Gregory Stragnell, Dr. K. A. Menninger, Dr. Trigent Burrow, Dr. H. S. Sullivan, Dr. C. P. Oberndorf, and Dr. Adolph Stern.

Association for the Study of Allergy.—This association will hold its annual meeting May 26th, at Atlantic City. Papers will be presented by Dr. Karl K. Koessler, Dr. Allen Eustic, Dr. W. W. Duke, Dr. I. S. Kahn, Dr. Charles A. Spivacke, Dr. William Engleback, Dr. Harry S. Bernton, Dr. G. T. Brown, Dr. Milton B. Cohn, Dr. Ralph O. Clock, Dr. George N. Jack, and Dr. George Piness.

American Association for Study of the Feebleminded.—The forty-ninth annual session of this society will be held in Raleigh, North Carolina, May 8th to 11th. Meetings will be devoted to Delinquency and Crime as Related to Mental Deficiency, Psychology and Mental Deficiency, Relation of Mental Deficiency to the Public, Motivation of Special Class Work, The Institution for the Mentally Deficient, Pathology and Physical Characteristics of Mental Defectives, and Psychiatry and Mental Deficiency.

Women's Medical Association.—The Women's Medical Association of New York City will have an informal dinner at the Women's City Club, Wednesday, May 20th, at 6.30 p. m. All women physicians and students, members and nonmembers, are invited. Applications for reservations enclosing check for two dollars should be made to Ethel D. Brown, M.D., 26 Gramercy Park, New York City, before May 18, 1925. The annual meeting of the association will follow the dinner.

Women's Medical Society of New York State.—This society will hold its nineteenth annual meeting on May 11th, at Syracuse, New York, in connection with the meeting of the state society. A scientific program will be given at the morning and afternoon sessions after the invocation by Dr. Eliza M. Mosher, honorary president, of Brooklyn, and an address of welcome by Dr. Elizabeth I. Shrimpton, of Syracuse, chairman of the committee on arrangements. A banquet will be held following the meeting.

Coming Meetings of Societies.—The American Medical Association will hold its annual meeting May 25th to 29th, at Atlantic City. The House of Delegates will convene at ten o'clock Monday, the 25th, at the Hotel Traymore. The Bureau of Registration will be located on the steel pier, where the scientific exhibits will also be held. Diagnostic clinics will be held in Music Hall, and the scientific sections will meet in the various hotels.

Other organizations announcing meetings in connection with the American Medical Association are: American Association for the Study of Allergy; American Gastroenterological Association; American Laryngological, Rhinological and Otological Society; American Proctological Society; American Therapeutic Society; Association for the Study of Internal Secretions; Medical Library Association; Medical Women's National Association; Radiological Society of North America.

State societies which will meet in the near future are:

Arkansas Medical Society, Little Rock, May 13th to 15th; Connecticut State Medical Society, Bridgeport, May 20th and 21st; Medical Association of Georgia, Atlanta, May 13th to 15th; Illinois State Medical Society, Quincy, May 19th to 21st; Iowa State Medical Society, Des Moines, May 13th to 15th; Kansas Medical Society, Topeka, May 5th to 7th; Maine Medical Association, Bar Harbor, June 23d to 25th; Massachusetts Medical Society, Boston, June 9th and 10th; Mississippi State Medical Association, Biloxi, May 12th to 14th; Missouri State Medical Society, Kansas City, May 5th to 7th; Nebraska State Medical Association, Lincoln, May 12th to 14th; New Hampshire Medical Society, Manchester, May 19th and 20th; Medical Society of New Jersey, Atlantic City, June 18th to 20th; Medical Society of the State of New York, Syracuse, May 12th to 14th; North Dakota State Medical Association, Fargo, May 18th and 19th; Ohio State Medical Association, Columbus, May 5th to 7th; Oklahoma State Medical Association, Tulsa, May 12th to 14th; Rhode Island Medical Society, Providence, June 4th; State Medical Association of Texas, Austin, May 5th to 7th; West Virginia State Medical Society, Bluefield, June 9th to 11th.

Foreign Correspondence.

VIENNA LETTER

(*From our own correspondent*)

Vienna, *March 19, 1925.*

MENTAL EXHAUSTION IN CHILDHOOD

Dr. Strauch, a reputed specialist on children's diseases, gave a lecture before the Vienna Medical Society on the importance of examining and recognizing mental exhaustion in children. He stated that this was the task of the practitioner as well as that of the school doctor. This question was put in the foreground by the unfavorable nutritive conditions during the war and during the after war years, and by the great spread of tuberculosis. Another factor leading to the rapid mental exhaustion of children was the recurrence of nasopharyngeal diseases. Of course, children afflicted with these diseases are backward and show slow progress in their studies. Often they are punished by their parents and even by their teachers by whipping. How much better it would be if the monthly visit of the school doctors would extend also to the examination of the nasopharyngeal apparatus of backward children. In most cases of diagnosed mental examination in children the most noteworthy pathological states were anemia and flaccid muscles. Professor Embden advocates phosphoric acid in such cases in the form of acid phosphate of sodium. This he maintained would increase the physical and mental efficiency in a great measure. Professor Noorden also had corroborated the efficacy of this drug in cases of mental exhaustion. He made extensive experiments with it and tested the physiological effect of the drug. Encouraged by the good results, he suggested the administration of phosphoric acid in any form. The lecturer, Dr. Strauch, had given the drug for experimental purposes to half the children in one class, without selection. He found surprising results in the improvement of these children. However, he did not recommend the drug to be given to healthy children, but insisted on administering it to weakly, emaciated children or convalescents and also to anemic, backward children.

PROFESSOR MELLER

The waves of the Hochenegg affair have scarcely subsided when a fresh storm was aroused by a lecture held by Professor Joseph Meller, the renowned oculist of the Vienna University. Nominally the patients who have been referred to the clinical hospital for admission by Meller, chosen on the outdoor department of the clinic, had been subjected to undue interrogations from the part of the clerks in the admission office as to their ability to pay the hospital expenses. It even happened that patients whom Meller desired to admit to his clinical ward for an instructional purpose were declined by the clerks unless they paid the hospital expenses in advance. In one of his lectures Meller criticized his method before his students and said that they missed many interesting cases on account of the conduct of the admission office. The situation was described in papers but was not remedied, despite the fact that Meller made a complaint against this abuse to the Ministry of Public Welfare. Thereupon Meller gave notice of his resignation and at the same time ceased to continue lecturing, much to the regret of his students. The medical faculty of the university and also the Ministry of Public Instruction have done everything in their power to persuade Meller to change his mind but to no avail. Only when all forums had promised due satisfaction to him did he resume his lectures, at which occasion his students, the professors and lecturers of the university appeared at his lecture and gave him a warm welcome.

DECREASE OF MEDICAL STUDENTS IN GERMANY

Up till now the number of first year medical students formed about one fourth of the total number of students. This proportion has greatly decreased in the latter years. The main reason for this is the excessively high living in Germany, which is at present one of the most expensive countries of Europe, not excepting England. In the winter season of 1923-24 the ratio of first year medical students to the total number of medical students on all courses has been as follows:

	Total number of students	*First year students*
Berlin	1,467	96
Bonn	506	14
Breslau	571	8
Erlangen	239	1
Frankfurt am Main	337	12
Jena	517	38
Köln (Cologne)	168	..
Kiel	402	4
Marburg	353	4
München	1,394	133
Nürnberg	640	76

DEATH OF PROFESSOR BUMM

Ernest Bumm, secret councillor, the director of the gynecological clinic of the University of Berlin, died in his sixty-sixth year in Munich in consequence of an operation performed on his gallbladder. The deceased was born in 1858 in Würzburg, where he attended the secondary school and also the university and was promoted to the degree of Doctor of Medicine in 1880. He was characterized by an iron energy, exact knowledge, great conscientiousness, ardent thirst for science, diligency, and great eloquence, as well as extremely sympathetic individual qualities. It is no wonder that with all such valuable properties he attracted a great number of physicians from all parts of the globe. The German imperial court had given him their confidence. His lecture room was always full. His best known medical work was *Treatise to the Study of Obstetrics,* which appeared in 1902 and since then has had fifteen editions, and has been translated into almost all languages. Dr. Bumm had acquired great fame by his early studies of the x ray treatment of uterine cancer.

GOITRE QUESTION IN BAVARIA

The Bavarian government has asked Professor Pfaundler and Professor Wiskott to make a special study on the occurrence of goitre in Bavaria. The government was induced to do this on account of the fact that the Bavarian health resorts which attracted countless visitors from abroad in former years have been missing the full pocketed foreigners in recent years. Some lay journals tried to explain the absence of foreign visitors by the alleged frequent occurrence of goitre in Bavaria in the afterwar years.

This statement has not been borne out by facts, because even the farthest southern parts of Bavaria, which border Switzerland, are practically free from goitre, although it is undeniable that goitre is a popular disease in Switzerland. The question blanks sent to all practising physicians of Bavaria confirm the fact that there is no trace of goitre. The figures do not attain the figure of the number of goitre cases in Switzerland. It is, at any rate, undeniable that there are parts in Bavaria which are rich in struma cases; this holds particularly true to low lying, densely populated rural places. In general, the disease is more common in females than in males. Internal secretory disturbances have been observed in conjunction with struma rarely, and even then they were only cases with manifestation of hyperthyroidism. On the basis of this report the government did not feel inclined to introduce systematic mass prophylaxis and special magistrative interference.

A QUESTION OF COMPETENCY DECIDED BY LAW

There was a railway accident in 1923 near Oradea Mare, Rumania, caused by the proved negligence of a switchman; among the severely injured was a girl of twenty, a bride, whose wedding ought to have taken place sixteen days after the accident, and who sustained compound fractures on both legs. She was taken to the hospital in Oradea Mare, where she was treated for about four months and afterwards she was taken to Vienna, to the hospital of Professor Spitzy, for some plastic operations. Despite the precise treatment she is able to walk with crutches only and wears orthopedic boots. She has spent one thousand two hundred and fifty dollars for medical attendance since the time of the accident. She claimed 3,000,000 lei compensation from the State Railways partly to cover her expenses, and partly to compensate her for losing the prospect of marrying and as compensation for her maintenance for her life, being entirely incapable to carry any breadwinning occupation. She is the daughter of a well to do private official. The State Railways refused to pay this sum, arguing that she ought not to have gone to Vienna for treatment, as the King of Rumania had had an operation for appendicitis a short time ago and the operation was done as well by a Rumanian doctor, Duvara.

Therefore the representative of the State Railways asked the Court to appoint a committee consisting of notable doctors to verify the necessity of having gone to Vienna. Members of this commission were: Dr. Djuvara, of Bucharest, the family doctor of the King of Rumania; Dr. Emil Jacobovici, professor of surgery at the University of Cluj; Dr. Pop Alexandru, surgeon of the Municipal Hospital in Oradea Mare, and Dr. Garö, forensic doctor. The medical committee had asked for eight days to compile its report. They made an x ray to ascertain the present condition of her feet. The counsel for the defense produced sixty original bills, and emphasized the fact that all doctors who have treated Miss Mihályi had sympathy for her on account of her tragic fate and charged modest fees, that had she gone to Bucharest it would have not made any difference from a financial point of view. From the other hand Vienna is half as far from Oradea Mare as Bucharest. The Court did not decide the case.

Letters to the Editor.

LATERAL TRACTION

NEW YORK, *April 3, 1925.*

To the Editor:

I note with interest that Dr. De Bar, in a letter to the MEDICAL JOURNAL and RECORD states that "Maxwell in the early eighties was the first surgeon to use lateral extension together with direct extension" in the treatment of fracture of the neck of the femur, and that Dr. Bradford has employed the same principle in his abduction splint without mentioning Maxwell's priority.

This statement is incorrect in two particulars. Maxwell was not the first surgeon to use lateral traction. He described the treatment in the *Chicago Medical Journal and Examiner,* for May, 1876, giving credit for the method to Dr. G. W. Phillips, of Dixon, Ill., who described it in the *American Journal of the Medical Sciences,* for October, 1869. Therefore, to quote Dr. Ruth, Maxwell's former associate and now the chief exponent of the treatment, "to Dr. Phillips must belong the honor and the credit of first describing and using this method of treatment." —*Albany Medical Journal,* January, 1913.

Aside from the question of priority, which may be of interest to Dr. De Bar, there is no similarity in the mechanical principles of the two methods. Lateral traction if carried to an extreme would actually pull the fragments apart. Abduction if carried to the normal limit would force them into contact by tension on the capsule. In actual practice the combined traction of Phillips, Maxwell and Ruth by supporting the limb and disentangling the overlapped fragments is far more effective than any of the routine methods.

The abduction enforced by Dr. Bradford's splint is not sufficient to assure fixation, and is supplemented by direct traction, which in an ambulatory brace is most uncertain in its action.

Neither method assures the quality of fixation required to provide the opportunity for interstitial repair of a complete fracture of the small part of the neck, and neither method is mechanically adequate to correct resistant deformity, the first essential of functional repair. Both are dependent upon the uncertain and inconstant action of traction and, therefore, on the quality of the nursing. Each is doubtless of service for selected case, the field for the splint being particularly limited for obvious reasons.

The abduction treatment alone is adequate to apply surgical principles in every type of fracture. It places the responsibility for the result therefore in so far as it is determined by the initial opportunity for functional repair on the one who undertakes the treatment. It is because of a lack of standard based primarily on the mechanical inadequacy of the methods in use that explains the past and even present neglect of this the most disabling of all fractures, and it would be unfortunate now that it may be enforced if the statement were accepted that the atrophy necessitated by fixation of the fragments causes nonunion, which might be prevented by the stimulation of such mobility as the abduction splint permits.

ROYAL WHITMAN.

Book Reviews

THERAPEUTICS

Clinical Therapeutics. By Alfred Martinet, M.D. Translated by Louis T. deM. Sajous, M.D. In two Volumes. Philadelphia: F. A. Davis Company, 1925.

The author, on page 14, calls attention to the recognized but often forgotten fact that some of our most learned members of the medical profession fail in the therapeutic management of patients, while many practitioners who are not well grounded in the science of medicine and surgery still, by their devotion and care and careful observation of patients, arrive at therapeutic success. He also says, on page 16, "The art of therapeutics is partly an individual gift which may be developed by practice and endeavor." These references show the trend of the author of these volumes to urge the individualization of the patient who has a disease and to emphasize the fact that, whatever the diagnosis may be, the patient has the right to have his disturbing symptoms prevented or ameliorated. This is emphasized on page 17 where he says that "proper clinical therapeutic management requires a correct and complete diagnosis, accurate knowledge of the therapeutic agencies available, and the adaptation of these measures to the individual patient and his illness."

On pages 21 and 22 the author discusses the importance of drugs as evidenced by their increasing use or greatly decreasing use. The reviewer believes that this method of determining the importance of a drug is more or less fallacious as, like the rest of the civilized world, the physician is subject to fashion. Therefore a drug may be of little importance but greatly in vogue, and many a valuable drug has been forgotten.

The author, in the reviewer's opinion, makes the mistake of trying to describe a lot of useless drugs. Books on materia medica and therapeutics are the only ones that perpetuate antediluvian material. All other books on medical subjects omit the old stuff and add the new, but books on materia medica and therapeutics while describing the new material seem to think that they must also describe the old material. A mistake. Another criticism of this book would be the tendency to copy prescriptions of anywhere from four to eight ingredients because they were pet prescriptions of some noted men. These suggestions for polypharmacy should be eliminated from modern books.

The discussions are very good on special and serum treatments and colloid therapy. The sections on climate, hydrotherapy, medicinal springs, exercise, electricity, and the therapeutic uses of x ray and radium are all excellent. The chapters on physical procedures are well written and clear in their description of these measures.

Volume II dares to have the title of *The Treatment of Symptoms and Diseases.* The reviewer is glad to note that the author dares to make important the treatment of symptoms. A successful clinician cannot ignore uncomfortable symptoms in his management of the patient. The neglect of such treatment is what sends many patients to practitioners of healing (?) who know nothing about the human body.

The section on the treatment of symptoms is arranged alphabetically and represents 263 pages of this volume. The rest of the volume is devoted to treatment of disease, with the exception of a final section on treatment of poisoning.

The translator has done excellent work and has added one or two parts to the book, to its improvement.

These volumes represent an enormous amount of careful work by the author and also by the translator, and they will be a valuable addition to any physician's working library.

The type, indexes, and the publisher's work are excellent.

BACTERIOLOGY

Pathogenic Microorganisms. By William Hallock Park, M. D. Philadelphia and New York: Lea and Febiger, 1924. Pp. 811.

Of all the textbooks on bacteriology of such reasonable compass that they occupy a single volume, the most practical is the *Pathogenic Microorganisms* of Park, Williams, and Krumwiede. In it is reflected the practical spirit of the Public Health Laboratory of the New York City Board of Health, now thirty-two years old, and for so many years under the scientific guidance of the senior author. The medical student, the practitioner, and even the general reader will find admirable and sound information concerning our present knowledge of bacteriology and serology, cemented together with sufficient theory to render it consistent. Certain additions have been necessitated in this latest edition by the rapidly increasing knowledge of certain phases of immunity, such as the bacteriophages, the newer work of the Dicks on scarlet fever, and the extensions of our knowledge concerning toxin-antitoxin immunization in diphtheria, as well as the results of the wide application of the Schick test. The bibliography contains references up to 1924, but the index is not quite up to the standard of the rest of the book.

CRIME IN RELATION TO INSANITY

Crime and Insanity. By W. C. Sullivan, M.D. Medical Superintendent, Broadmoor Criminal Lunatic Asylum. New York: Longmans, Green & Co.; London: Edward Arnold & Co., 1924. Pp. vii, 259.

This book contains much important matter and a point of view that cannot be brought too emphatically before the public. The material of the writing is designed primarily for students of psychiatry but it meets a very real need for information at large as to the incidence of crime in relation to insanity. This is emphasized from both sides through the author's presentation: the crime as so often only one form of the symptomatic manifestations which result from a pathological background, and the proneness of such a diseased mentality to result in those acts which in their effects constitute injury to, therefore crime against, society. Thus crime and the criminal nature are discussed not as separate entities in themselves but as features in a wider situation. As such they can be understood only by investigation of each in-

dividual case in its mental condition. This is by no means to neglect the social aspect of the deed but only so much the better to attack the problem of society's own safety. Various mental diseases, together with mental defects, are set forth in detail with the special incidence of crime in relation to them. The author suggests a distinction between crimes due to economic conditions and those resulting from the impulses which find occasion to break through under conditions of mental disorder. He is not unmindful of a closer relation between these two groups of criminal acts than might at first appear. Yet this is one of the places where the interpretative consideration of impulsive and other criminal acts might have been carried even deeper. The book, however, is very instructive and suggestive in its setting forth of the interrelation of mental disorders, with their psychological and physiological (endicrinous) background, and the outbreak of criminal deeds. It gives thus a broad basis on which to consider the question of responsibility.

LOCAL ANESTHESIA

Local Anesthesia Simplified. By John Jacob Posner, D.D.S., Chief of the Dental Department Harlem Dispensary. With fifty-five illustrations. St. Louis: The C. V. Mosby Company, 1924. Pp. 114.

To the dentist who is seeking a simple and conservative account of the principles and technic of local anesthesia, this book can be heartily recommended. It is brief, direct and well illustrated. The details concerning structure and nerve supply are not obscured by lengthy discussions of anatomy and physiology. The technic is outlined to meet the practising dentists' requirements. Emphasis is laid upon two injections. They are the new supraperiosteal injection for infiltration anesthesia and the mandibular injection for block anesthesia. With these two injections alone it is possible to treat ninety-five per cent. of the cases that arise in ordinary practice.

DISEASES OF NERVOUS SYSTEM

Précis de pathologie interne. Maladies du système nerveux (Cerveau, cervelet, méninges, pédoncules cérébraux, tubercules quadrijumeaux, protubérance, bulbe). Par Le Dr. Henri Claude. Avec 97 figures dans le texte. Bibliothéque du Doctorat en médecine publiée sous la direction de A. Gilbert et L. Fournier. Paris: J. B. Baillière et Fils, 1924.

This volume is replete with details of every phase of disorder manifest in the various portions of the nervous system. Its systematic arrangement, its clear, concise statements, make it a ready book of reference for the student or the practising physician confronted by the simpler or the more complicated nervous disorder. The book is not devoted to therapeutic measures, yet even as it stands it leaves one with the lack of a comprehensive functional point of view. This would have set these disorders, even in their more mechanistic appearance, in a relation to a personality trying to function behind its disabilities, or perhaps, in faulty function, having established certain phases of the disorder. Even a word of emphasis upon this dynamic relation of anatomical lesion and organism would have given a vital significance to these otherwise authoritative but somewhat overstressed details.

MEDICAL GUIDEBOOK

Consultations du Médecin Praticien. Guide de Pratique medico-chirurgicale journalière, par le Dr. Fred Blanchod. Paris: J.-B. Bailliere et Fils, 1925.

The reviewer confesses to a certain prejudice, common to medical minds, against guide books to practice in which one looks up the treatment under disease labels and in which the author skips nimbly, if not like the chamois "from peak to peak," at least from abscess to accouchément and thence to adenitis and aphthæ. It stands to reason and to experience that this method, while convenient and timesaving, is apt to be unscientific as well as uneven. Dr. Johnson said of a female professional whistler that the surprising thing was not that she did it badly but that she did it at all. The surprising thing about Dr. Blanchod's work is not that it is not done badly, but that it is really done very well. For those who need this kind of a book, this is just the kind of book they need.

SCHOOL MEDICINE

An Introduction to School Medicine. By H. Leslie Cronk, M.A., M.D. London: H. K. Lewis & Co., Ltd., 1925.

This practical little volume from the pen of a health officer of experience deals with the methods of examination, diagnosis, treatment, and prevention "of minor departures from health which a child attending school with more or less regularity may present." It is more a matter of determining whether the child actually is in full health and up to the physiological requirements of its years, than of disease or even prepathological states. Cronk's study includes growth, malnutrition, food requirements, sleep, postural deformities, to each of which a chapter is devoted. There are, in addition, sections on special topics, notably an excellent résumé of the important subject of visual defects in children.

MATERIA MEDICA

A Textbook of Materia Medica for Nurses. By A. L. Muirhead, M. D., and Edith P. Brodie, A.B., R.N. Second edition. St. Louis: C. V. Mosby Co., 1924. Pp. 190.

Miss Brodie is to be congratulated on the splendid revision she has made of Dr. Muirhead's book. This small textbook presents all the information that is needed by nurses on the subject of drugs. The book is terse, well written, well arranged, and should be owned by every nurse. The publishers are to be commended for the good clear type, splendid arrangement and the general fine appearance of the book.

THE ARAB

The Arab at Home. By Paul W. Harrison, M.D. New York: Thomas W. Crowell Company, 1924.

An exceedingly readable account of a medical missionary's adventures in desert Arabia. The writer is indeed a brother to all mankind. His labors for the Arabs have rewarded him richly in friendship, in the tender understanding of suffering humanity which makes the medical profession so immensely worth while. The wonders of modern medicine are indeed open sesame to brotherhood between man and man, primitive tribe and Christian teaching. Especially interesting is Dr. Harrison's understanding revelation of acceptance of theory and rejection of fact by the natives he treated, as related to all the details of missionary work. No proselytizing work in this, but a human account of humane work.

Medicoliterary Notes.

Suit has been brought, according to press reports, against a Berlin theatre where a revue has been running depicting a scene on one of Germany's de luxe steamers in which the passengers are seasick. The company owning the steamer, which is designated by name on the stage, maintain that their business has been affected detrimentally by the seasick scene.

* * *

When G. P. Putnam's Sons published Robert Keable's *Numerous Treasure* they left out of the book a recipe for a cocktail invented by the author and named in honor of his heroine. It was feared that prohibition enforcement agents might object to the publication of information that might make some of us break the law. But who would want to experiment with a cocktail invented by an Englishman?—*N. Y. Times.*

* * *

Dresden, Germany, has devised an interesting and effective method for disseminating public health information and publicity. A calendar has been designed and printed, with pertinent and attractive illustrations, and containing notes, rules and articles on health subjects by German physicians of note. Although the calendar is printed in German, the cartoons and pictures are so much to the point that it may be used to advantage in other countries.

* * *

The annual report of the Surgeon General of the Navy for 1924 has been issued. This report announces the establishment of a new Planning Division of the Bureau of Medicine and Surgery in order that more consideration could be given to the problems of the Medical Department of the Navy "in future war plans."

* * *

England now has her version of *What Price Glory?* in a play entitled, *Tunnel Trench,* by Hubert Griffith, recently produced at the Prince's Theatre, London, by the Repertory Players. In commenting on the realism of the play and its lack of all melodramatic elements, a recent British review says: "The steady drag of the presentation was the perfect vehicle of the dramatist's intention. The modern warrior for whom there is no joy in battle, no triumphal junketings at Rome, no memories that are glad to the mind, plods through this play with the patience that is more terrible than passion. . . . One heard people saying, 'Yes, it may be wonderful, but why should we be harrowed with these reminders?' The answer is in the news of the day."

* * *

Among interesting articles in March magazines are: The Insects Are Winning, by William A. Dupuy, in *Harper's;* Biology Holding the Future, by J. B. S. Haldane, in the *Forum;* Harlem, Mecca of the New Negro, by various authors, with illustrations from drawings by Weinold Reis. in the *Survey Graphic;* and Crime and Punishment, by Horace J. Bridges anl Clarence Darrow, in the *American Mercury.*

* * *

Announcement has been made that the first International Congress on Child Welfare will be held at Geneva, August 24-28, 1925. The program will include addresses and discussion on medical, hygienic, sociological, legislative, educational and propagandic problems. A prominent place on the program will be given to the education of the children of all countries in international good will.

* * *

Sard Harker, John Masefield's only novel, has been selected by the *London Times* as one of the four best novels published in Great Britain during 1924.

* * *

Mental Hygiene inaugurates its ninth year of publication with a January number of unusual interest. Among the articles included are The Application of Psychiatry to High School Problems, by Anne T. Bingham; A Study of Certain Erotic Practices, part 2 of the report based on the replies of 2,255 women to questionnaires prepared by the Bureau of Social Hygiene; One Hundred and Fifty Policemen; Some Observations Upon Probationary Policemen of the Detroit Police Department, by Jessie M. Ostrander; Drug Addiction in Its Relation to Crime, by Lawrence Kolb, M. D.; Dementia Precox and Crime, by Dorothy Crounse; "Good" Education and "Bad" Children, by Ira S. Wile, M. D.; Report on a Questionnaire Study of Personality Traits with a College Graduate Group, by F. L. Wells, Ph.D.; and A Group of Psychoneurotic Ex-Service Men, by Lloyd H. Ziegler, M.D.

* * *

The Department of Physiology of the University of Toronto has recently been making an investigation of the preparation of insulin in large quantities from bony fishes. Conclusions have been submitted by Prof. J. J. MacLeod that in the opinion of the investigators both cod and pollock may be made a profitable source of insulin in the Canadian Maritime Provinces.

* * *

Physicians as playwrights have made two appearances on Broadway during this season. The plays for which they are responsible were *In the Near Future,* by Dr. Abraham Goldknopf, produced by the Mutual Theatrical Society, and *The Complex,* a play based on psychoanalysis, by Dr. Louis Bisch.

* * *

A study of the germicidal properties of ultraviolet rays has been made recently by the Bureau of Standards of the U. S. Department of Commerce. A report states that the shortest waves were found to be the most active and forceful, since they are capable when sufficiently intense of causing death through an exposure of only one second. Longer wave lengths required a greater intensity and had a much slower action. Tests showed that the germ killing effect of ordinary sunlight is due to waves so short that they are invisible to the human eye.

* * *

A recent publication which has raised a storm of discussion is J. B. S. Haldane's *Callinicus,* published by Dutton as one of the Today and Tomorrow Series. The book is an argument and plea for the use of gas as the least brutal of all the weapons of modern warfare, for so it is to the author, who is a biochemist at the University of Cambridge. It is brilliantly written and well worth reading, however much the reader may disagree with the writer's conclusions.

* * *

The Boston press has recently reprinted some of the answers to questions in a civil service examination which covered some of the aspects of mental hygiene. A few of the answers follow: A moron is a person who has fallen to the lowest ideals possible. A moron is a wise fool. Moron—a species of immortality difficult to define with words or eradicate when found. Moron—an infant whose parents leave it and do not acknowledge parentship. Kleptomaniac—one who steals while walking in his sleep. A child afflicted with mental hygiene is one whose brain is not normal. A child suffering with mental hygiene should be placed in a proper school to cure same as much as possible. One question was, What action would you take in the case of theft of fruit? One of the answers was, Perhaps the child is a kleptomaniac. Remove her from the fruit; or perhaps the parents also steal fruit. Discipline the parents.

* * *

The Child and His Problems, by Alice M. Hutchinson, M.D., with a foreword by H. Crichton Miller, is a late publication of Williams & Norgate, London, England. The writer is senior assistant at the Hospital for Sick Children, and at the Tavistock Clinic. There are chapters on the nervous child, the difficult child, and the only child, as well as much material that should be of value to those dealing with socalled normal children.

* * *

In the new Hebrew University which opened April 1st on Mount Scopus, Palestine, the various departments are being organized as means are available. At present there is a microbiological institute and a chemical institute, which form the beginning of the faculties of medicine and science; research institutes in physiology, physics and mathematics are being organized. The establishment of these particular institutes at the opening of the university was decided upon because the public health problems of Palestine present numerous questions in bacteriology, serology, immunity and experimental medicine generally.

Abstracts from Current Literature

PHYSIOTHERAPY

Action of Röntgen Rays on Blood Pressure.—Carl chroeder (*Zentralblatt für Gynäkologie,* August 16, 1924) sserts that the fall in the blood pressure of ten to forty illimetres of mercury following the use of röntgen rays, specially in cases of hypertension, may be explained as fol- ows: the resulting erythema dilates the capillaries, which, n turn, leads to the fall of the blood pressure. The dilata- on of the capillaries is apparently the result of the action f the röntgen rays on the vascular nerves.

Treatment of Cancer of the Lip by Irradiation.—ernard F. Schreiner and Louis C. Krebs (*Journal of Can- er Research,* July, 1924) classify their cases into three roups:

Group I included all lesions confined to the lip up to in- olvement of the whole lip, with no demonstrable involve- ent of the lymphatics. Fifty-eight out of sixty-nine of hese patients were clinically well; seventy-eight per cent. ver a period of three years and fifty-two per cent over a eriod of five years.

Group II included lesions of the lip with definite meta- tatic involvement of the lymph channels, but still classified rom the viewpoint of surgery as operable. Thirteen out f thirty-six patients were clinically well: thirty-nine per ent. for three years and thirty per cent. for five years.

Group III included far advanced tumors of the lip with netastases in the neck which were fixed, involving the peri- steum or ulcerating, socalled inoperable cases. In this roup radiation is of little value.

There are two types of tumor on the lip, the papillary or roliferating type and the infiltrating type. These two types hould be clearly distinguished from each other as they espond differently to irradiation, the infiltrating type being omewhat slower to respond to treatment. The proper reatment is to plant bare tubes of radium in the base of the umor. The authors used unfiltered x rays in the treatment of all superficial tumors. The lymph bearing areas were reated by means of high voltage x ray. In the cases of the econd group healing in at least thirty-four per cent. could e brought about by x ray therapy alone.

X Ray Treatment of Whooping Cough.—Henry I. Bowditch, Ralph D. Leonard and Lawrence W. Smith (*American Journal of Diseases of Children,* September, 1924) assert that the younger patients and the earlier cases of whooping cough seem to derive the greatest benefit from x ray therapy. The most striking effects of the treatment have been seen in the reduction of the paroxysms, both actual, in the number of whooping attacks, and relative, in a diminution in the severity of the paroxysms. The same diminution in the number and severity of the paroxysms occurs whether the disease is at the onset of or later in the paroxysmal stage. The blood picture roughly parallels the clinical improvement. No positive cultures of the Bacillus pertussis were obtainable after the third week. Complement deviation experiments show that there is a specific antibody produced during the disease. In the cases complicated by bronchopneumonia, the same relief from the paroxysms was noted following the use of the x ray. This in itself is the chief factor in effecting a cure, for by conserving the strength of the child in this manner his resistance must be considerably heightened. In addition, physiotherapy in the form of diathermy was used in the cases complicated by bronchopneumonia.

Resorption Effect of Diathermy in Gynecological Diseases.—Ivan v. Büben (*Zentralblatt für Gynäkologie,* September 6, 1924) uses three different procedures to obtain the resorption effect by diathermic treatment in gynecological diseases: The first type is the abdominodorsal, in which by means of a small plate electrode placed over the symphysis and a larger one under the back, the entire lesser pelvis is uniformly heated through. With this method the grade of heat attained is not intensive enough and, therefore, this procedure is not used very often.

The vaginal application is used much more frequently, as in this way the uterus and its surroundings can be heated through most intensively. An olive electrode, supplied with a thermometer of suitable size is inserted into the vagina and a plate electrode, the size of the hand, is placed in position over the area complained of either on the abdomen or on the back. With the proper application of the external electrode the diseased area can be treated with any desired size of cone of heat and in this way completely heated through.

Whenever vaginal applications are impossible for some reason or another, the rectal application may be applied. This procedure is indicated, chiefly, in those forms of residual exudate and adnexal diseases that are localized in the region of the culdesac of Douglas, in which the pathological tube or ovary is fixed to the pouch of Douglas and therefore can be influenced by the vaginal electrode only incompletely. In the rectal application, intensive heat may be applied to the changes of fixation in the region of the culde-sac of Douglas with the aid of the olive electrode inserted into the rectum and the plate electrode applied externally.

Even though diathermy is far superior to all the other procedures that produce resorption of exudate, nevertheless it is not a panacea to be used in every case. Like all other methods of treatment it has its contraindications; if these are not observed it may even do harm with the amount of heat that cannot be obtained by other therapy.

Radium Therapy of Carcinoma of the Uterus.—I. Belugin (*Zentralblatt für Gynäkologie,* September 6, 1924) was able to show that with collections of pus localized in the lesser pelvis the use of radium is extremely dangerous, in so far as it may lead to a peritonitis or generalized infection. This develops the more readily the thinner the capsule surrounding the pus focus and the closer to it the radium is applied. The main factor in the development of a generalized infection is apparently to be ascribed to the chemicobiological effect of the radium rays, on account of which the treatment with radium is contraindicated in the presence of pus foci in the lesser pelvis. Inasmuch as irradiation therapy is the only possible method of cure in old and inoperable cases of carcinoma of the uterus, it is advisable to produce an autoimmunizarion of the patient before instituting radium therapy in these cases.

Irradiation Treatment of Malignant Tumors.—Alois Czepa (*Wiener klinische Wochenschrift,* September 11, 1924) states that the present day pessimism regarding the irradiation treatment of malignant tumors is not justified. Inoperable carcinomas and sarcomas, unless a severe grade of cachexia or multiple metastases render the prognosis unfavorable a priori, should be irradiated. The possibility of improving the conditions of life and of lengthening life are not so bad as is usually believed. It is absolutely necessary, however, that the treatment should be varied to suit the individual case. In addition to röntgen irradiation, general irradiations with artificial sunlight are indicated in order to build up the body strength.

Radiotherapy in Tumors of the Breast.—John F. Erdmann (*American Journal of the Medical Sciences,* December, 1924) emphasizes these points:

No tumor in the breast is a desirable tenant, even if its innocence be proved without a question of doubt. A growth in the remaining breast is as likely to be of primary origin as was that in the breast first removed. At the present day we are unable to state positively what the influence of röntgen ray and radium is either as a preoperative or postoperative aid. But in view of many apparent reductions in size, previous to operation in cases considered inoperable, the use of röntgen ray and radium should be encouraged until proved a menace. In my opinion too few years have passed for positive results to be shown even in view of some of the glowing reports at present regarding the nonrecurrence. Postoperative treatment should not be neglected by preoperative until some definite proof of its help or inefficiency has been established. In the presence of late metastases the powerful currents of the present day should be given a thorough test to prove or disprove the efficiency of this method of treatment. The most thorough and painstaking wide removal with remote glandular and fascial dissections will tend more and more to increase our percentage of cures and extension of life. The radical operation is attended with so low a mortality as to promote a greater desire on the part of consulting physician to demand early operation.

Use and Abuse of X Rays in the Treatment of Common Skin Diseases.—Earl D. Crutchfield (*New Orleans Medical and Surgical Journal,* January, 1925) says that the x ray is the most valuable of all the therapeutic agencies in dermatology but it is a very powerful and dangerous remedy unless used with discretion. However, if applied with care and accuracy, it is a most harmless agent. The fact that so many conditions respond to the x ray may often be a drawback, as the condition may be cleared up without ferreting out the etiological factors, particularly in those conditions where the etiology is obscure. Again, it is of extreme importance that no skin condition be treated without a reasonably sure or definite diagnosis being made. Unless this is conscientiously adhered to, erythema nodosum, pityriasis rubra, lupus erythematosus, rosacea, nevus pigmentosus, keratosis follicularis, or similar conditions, may receive x rays to no advantage. Lastly, the x ray is an important part of the dermatologist's armamentarium, but as a general rule never more than one skin unit should be administered within the period of a month, and only in exceptional cases should more than four units be administered.

Effect on the Blood of Irradiation, Especially Short Wave Length Röntgen Ray Therapy.—George R. Minot and Roy G. Spurling (*American Journal of the Medical Sciences,* August, 1924) studied the blood in forty-two cases, chiefly of cancer, before and after fifty-six röntgen ray irradiation treatments. Particular attention was given to the observations of twenty-two of the patients given thirty-six intensive short wave length treatments. The other irradiations were milder. Cases of disease of the hemopoietic tissue are not included and the statements below require modification when applied to such conditions.

The most important effect of customary therapeutic doses of irradiation on the blood elements is to decrease the number of white cells, especially lymphocytes, so that leucopenia and lymphopenia may occur. Preceding the decrease in the white count a transient increase develops, due to increment of polymorphonuclear neutrophiles. Very small doses of irradiation may permit a lymphocytosis.

When a customary therapeutic dose of short wave length röntgen rays is given, it causes the white count to reach its lowest point about six days later; at that time leucopenia is more often present than not. A decrease below normal of the absolute numbers of bone marrow white cells, which is indicative of marrow depression, is not unusual. Leucopenia lasts on the average about nine days, but may persist for over four weeks. If treatment is given again before the number of cells have remained for some time at their original level, leucopenia of a greater degree and duration is produced than after the first treatment. The fall in the lymphocytes is greatest in the first twenty-four hours, but they continue to drop for about three days. These cells rise with the white count, but do so proportionately more slowly. Subsequent treatments may keep the lymphocytes fewer in proportion to the white count than following the first irradiation.

The new short wave length röntgen ray therapy, suitably given, produces no changes in the blood that are of a different character from those occurring after milder yet intensive irradiation. However, it does produce more rapid, marked and persistent changes than milder treatment, and if the treatment consists of merely moderate long wave exposures it may not even cause a decrease of white cells.

An eosinophilia, of often seven and as high as twenty-three per cent. is usual two to three weeks after short wave length irradiation. It appears to develop particularly following repeated exposures. After irradiation the blood contains many degenerated white cells, especially in the first three days. There is scant mention in the literature of this feature of the blood in man. Larger doses produce greater numbers of these cells than smaller doses. After short wave length therapeutic irradiations the degenerated cells often amount to twenty-five to one hundred formed white cells.

Some increase of immature white cells may be observed, especially at about the time the white count begins to rise, after large doses of irradiation. A slight increase of the platelets soon after irradiation is common. They are depressed less readily than the white cells, but following the transient rise they are often found slightly decreased and rarely markedly. Combined with leucopenia they may be an indication of greater marrow depression than a decrease of only the bone marrow white cells. About four days after intensive irradiation and prior to a definite rise in the white count, the platelets rapidly increase and remain elevated above normal for days or weeks.

Important changes in the count of the red blood corpuscles and hemoglobin percentage do not occur as a result of mild or intensive therapeutic irradiation. Changes in the numbers of immature cells occur.

The clinical condition of the patient will influence the degree and duration of the blood changes after irradiation but anemia *per se* does not seem to be of any great importance. The white cells of patients whose clinical condition is similar, given the same dose in the same manner, show considerable variation. On the average, patients with higher white counts before irradiation will present leucopenia and marked lymphopenia less often than those with lower counts.

Much more important than the condition of the patient in determining the influence of irradiation on the blood is the size, intensity and character of the dose; larger doses producing greater blood changes than smaller ones.

The amount of surface area irradiated is a factor of great importance in determining the degree and duration of the decrease of white cells. The greater the surface area exposed to a given amount of irradiation the more profound on the average, is the effect on the white cells. Secondary radiation, which is greater with larger than smaller doses with short wave than long wave lengths, and with a large than a smaller portal of entry, probably plays a rôle in the production of blood changes.

Depression of the activity of lymphatic tissue and bone marrow are probably undesirable states, yet occur without obvious detrimental effect. The benefits derived from radiation appear to offset the production of leucopenia and lymphopenia.

Prior to irradiation the blood should be examined. In five thousand to the c.mm. or more, irradiation may be given without producing serious harm to the blood forming tissues. It is not ideal to give irradiation when leucopenia is present, but it may be done. With marked leucopenia repetition of treatment probably becomes a more serious event.

Before treatment is given to a patient with leucopenia a complete study of the formed blood elements should be made, for it may reveal a greater degree of marrow depression than expected and thus induce decision against irradiation. To determine whether or not to treat a patient with leucopenia one must decide whether the benefit of treatment will offset the disadvantages of an increased depression of the hemopoietic tissue. The latter may be of relatively little importance and distinctly less harmful than permitting a lesion to go untreated.

Radiation in the Female Breast Before and After Operation.—Walter E. Sistrunk (*Southern Medical Journal,* March, 1924) divides cancers of the breast into, 1, primary cancer of the breast, in which the palpable disease is confined to the mammary gland; 2, primary cancer of the breast, with palpable lymph nodes in the axilla; 3, primary cancer of the breast, with distant metastases; 4, recurrent carcinoma in the mammary area, with or without metastases; 5, distant metastatic carcinoma without local recurrence.

1. In primary carcinoma of the breast without palpable lymph nodes, we are justified in recommending a preoperative course of deep x ray therapy, to be followed in two or four weeks from the beginning of this treatment by surgical excision. The course of preoperative treatment will require a period of about ten days to two weeks, in order to avoid any constitutional symptoms. If the patient is from a distance and time is important, the operation can usually be performed within forty-eight hours after the last dose. With some risk of radiation sickness the treatment can be crowded into four to six days. The treatment so far as possible should be directed into the mammary tissues, the axillary and supraclavicular glands with the avoidance of the lung tissue so far as is possible if high voltage x rays are used.

2. In primary cancer of the breast with palpable lymph nodes in the axilla, the results of surgical treatment have been less satisfactory than in Group 1. In general, by surgical treatment alone the cures are estimated at from twenty to twenty-five per cent. These values can be doubled by adding preoperative and postoperative treatment. Unfortunately that still leaves a mortaliy of from

fifty to sixty per cent. In general, a course of preoperative radiation and operation should be given as soon as the constitutional effects have passed followed by a second course of radiation.

3. Primary cancer of the breast with distant metastases, such as involvement of the mediastinum, pleura, lungs, bone, liver, etc., is, so far as cure is concerned, hopeless from any known method of treatment. In some instances, the known local lesions can be made to disappear by radiation. Unfortunately, such lesions are usually only part of a general carcinomatosis. While such localized or known lesions are being treated the others are continuing to develop. If one is fortunate enough to get a case with the metastases localized to one or two lesions, he may succeed.

4. Recurrent carcinoma and known metastases can usually be made to disappear, but in most instances there will be ultimate failure. Patients, however, treated as long as fifteen years ago for recurrences, are still free from any known disease.

5. In the treatment of distant metastases without local recurrences, success can be hoped for only if they are strictly localized and not merely a part of a general carcinomatosis.

The author concludes as follows: Preoperative radiation treatment is intended to devitalize the carcinoma cells and to render the soil unfavorable for implantation. Postoperative treatment is intended to destroy any unremoved carcinoma cells and to destroy any neighboring metastases. The combination of surgery and radiation will probably double the good results obtained by surgery alone. Inoperable cases can sometimes be made operable by radiation. As much care and skill are required for the application of radiation as for excision by surgery. The possession of an x ray machine or of a quantity of radium is no more a guarantee of efficiency than is the possession of a set of surgical instruments a guarantee of surgical skill.

Ureteropyelography.—D. N. Eisendrath (*Annals of Surgery,* November, 1924) believes this procedure to be an important aid to abdominal diagnosis in general. It should never be employed in cases of acute renal infection or where a cystitis is so severe that even ureteral catheterization is a menace. The technic which is safest and most frequently employed is the following:

Preparation of the patient.—No special preparation aside from that incident to the radiography of the urinary tract is needed. Special stress should be laid upon the necessity of abstaining from the ingestion of food and of much liquid for six hours, at least, before the use of the sodium iodide solution. Even sterile water injected into the renal pelvis of some individuals will cause reflex nausea, vomiting and even symptoms of collapse, and these will be greatly decreased if the alimentary tract is empty.

Injection of the solution.—Too much emphasis cannot be placed upon the importance of injecting a solution warmed to near body temperature, slowly and with but little pressure. It is not necessary any longer in my opinion to employ the gravity method nor to insert a manometer between the syringe and ureteral catheter. First aspirate the contents of the renal pelvis and then inject seven to ten c.c. of the solution with an ordinary Luer syringe after having introduced a No. 5 or No. 6 ureteral catheter whenever possible as high as the renal pelvis. The best indications that enough solution has been injected to distend the renal pelvis is the degree of resistance to any further injection. If the patient does not complain of pain and there is no resistance, it is perfectly safe to continue to use more of the solution until there is distinct resistance or one can stop when fifty or sixty c.c. have been injected, to take the first picture and wait until it is developed before injecting any more solution.

The first exposure is made while the catheter is inserted either into the renal pelvis or lies at the level of an obstruction in the ureter. The catheter is next withdrawn until it lies near the lower end of the ureter and a second exposure made after injecting enough solution until resistance is again encountered. The third exposure is made about one hour, if possible, after the first one to ascertain whether there is any retention in the renal pelvis or ureter as is so often seen in cases of ureteral stricture. Ordinarily we only make exposures when the patient is in a horizontal position, but if there is any suspicion of a movable kidney, the patient must be raised to the vertical position by elevating the x ray table at one end before the catheter is withdrawn from the ureter in order that an exposure may be made to determine the degree of mobility of the kidney and a kinking of the ureter. If possible all of the solution should be permitted to escape before the ureteral catheter is withdrawn. Do not hesitate to make a bilateral exposure at the same sitting, provided that the solution is allowed to escape or is aspirated from one side before the second is injected. An unobstructed renal pelvis or ureter empties within a few minutes as one can readily observe if a series of exposures are made at the same sitting.

Röntgen Ray Intoxication.—S. L. Warren and G. H. Whipple (*Journal of Experimental Medicine,* December, 1824) state that a suitable dose of x ray will destroy in large measure the epithelium lining the crypts and covering the villi of the small intestine, leaving empty crypts and naked villi exposed to swarms of bacteria in the intestine. The outstanding feature of the experiments described on dogs is the striking contrast between obvious injury of the intestinal epithelium and the lack of invasion of the intestinal bacteria into the tissues, lymph or blood. Apparently, therefore, the intestinal epithelium is not the all important barrier which protects the tissues from invasion by intestinal bacteria. The authors believe that the experiments described indicate that the hard x rays which injure the epithelial cells of the intestine travel in straight lines through the host's tissues with no evidence that these rays are deviated to injure tissues outside of the direct x ray pathway.

Treatment of Inflammatory Diseases of the Genitals with Ultrasun.—G. Haselhorst and Fr. Peemöller (*Zentralblat für Gynäkologie,* February 16, 1924) report that the treatment of adnexal tumors with the ultrasun is applicable only in subchronic and chronic cases. The good results in some cases cannot be denied, but they are not particularly striking and they can be achieved just as well and to the same extent with other more simple methods. The ultrasun is practically free from the danger of burns because it emits rays that lie within the biologically stimulating portion of the ultraviolet rays, namely, between wavelengths of 313 and 297, which contain very slight intensities of light in comparison with the artificial sun lamp. They good results in some cases cannot be denied, but they are suitable for irradiation of serous and mucous membranes. This effect is accomplished through the relatively slight intensity of the current and through the addition of metallic salts (probably combinations of nickel and cobalt) to the carbon electrodes.

Rôle of the Liver in General Röntgen Injury of the Body.—Paul Neuda and Fritz Redlich (*Wiener klinische Wochenschrift,* November 1, 1924) are enabled to show that röntgen rays have a very definite action upon albumin, which is recognized, among other signs, by the displacement of chlorides in the organism. In normal individuals, especially in those having a healthy liver, this process goes on without any special disturbance and the excessive chlorides are excreted by the kidneys; if this regulating process does not take place (as in relative or absolute insufficiency of the liver), there results, for reasons not as yet entirely explained, a disturbance in the physicochemical equilibrium of the blood colloids with its symptomatology, including a reduction in the number of leucocytes, a diminution in the blood pressure, a change in the time of coagulation and of the refractometric index, as well as a diminution of the chlorine content of the blood. These changes result in the symptomatology of severe general röntgen ray injury of the body.

Fulguration of Hunner Ulcers.—H. Dawson Furniss (*American Journal of Obstetrics and Gynecology,* March, 1924) concludes as follows: 1. All possible foci of infection should be removed. 2. Resection is a formidable operation with at times spectacular and at times dismal failures. 3. Fulguration is a simpler method of dealing with the problem and should be tried first. 4. The results are frequently most gratifying. At least, temporary relief can be counted upon, and if there is recurrence the ulcer can be fulgurated again. The willingness of the patients to submit to second and third fulgurations is a convincing testament of the relief they receive. 5. Until something better is discovered fulguration should be continued. 6. The greatest relief and best looking bladders are those in which fulguration was the most thorough, and performed under sacral anesthesia through the air distended bladder. 7. With increased experience and perfection of the technic even more satisfactory results may be anticipated.

Measurement of Ultraviolet Light.—A. Webster, Leonard Hill and A. Eidinow (*Lancet,* April 12, 1924) recommend the measuring of ultraviolet light with the use of a standard acetone methylene blue solution and a standard quartz tube having an internal diameter of three mm. This is filled with a solution consisting of two parts of standard methylene blue solution and one part of acetone. The method of measuring is described in detail.

Röntgen Diagnosis of Postoperative Ileus.—J. T. Case (*Annals of Surgery,* May, 1924) emphasizes the statement that the suggestion of this x ray method for establishing a diagnosis of ileus is not intended to serve in any way as a substitute for the other clinical methods already in general use, but this x ray examination, carrying with it so little disturbance to the patient, requiring no preparation, and often giving much important help, is suggested as just one more means of diagnosis in the hope of reaching more quickly a definite decision. This report is based upon an extensive postoperative x ray study covering several hundred patients, the great majority of whom had no untoward symptoms during their postoperative course, the examination being made to establish the normal postoperative behavior of the bowel and to serve as a basis for the conclusions above expressed concerning the value of the x ray study in the early diagnosis of postoperative ileus.

Use of X Rays in Antenatal Work.—Edward W. H. Shenton and Charles H. S. Horowitz (*Lancet,* February 16, 1924) now use röntgenography in any case about which there is any doubt in a primipara where the head is still above the brim of the pelvis during the last two weeks of pregnancy. When the röntgenograms show an adequate disparity between the fetal head and the pelvis the patient is allowed to go on to labor. The authors have had few disappointments with this procedure. By taking a plate at a different angle, so that a view is obtained more directly down into the pelvis instead of a merely transverse view of the inlet, the physician will not be misled by a well marked promontory of the sacrum. Röntgenograms can also be obtained now of the outlet of the pelvis. The plate also gives some idea of the amount of ossification of the head, which also helps in determining when the fetus is overdue. Pelvimetry is no longer necessary, for what really matters are not the absolute but the relative measurements of the head and pelvis, and these are readily seen in the röntgenogram. There is not the slightest risk to mother or child. Newborn babies show complete immunity to ordinary x ray exposures and therefore these need not be feared. Another advantage is the elimination of the disagreeable manual manipulation. The time of ossification varies considerably. Stereoscopy enables us to see the fetal head and the surrounding bones in relief.

What the Practitioner Should Expect in X Ray Diagnosis.—F. B. Stephenson (*Colorado Medicine,* August, 1924) presents the following list of "don't expects" and says that the practitioner can expect almost anything in x ray diagnosis which is not included.

Don't expect an unqualified diagnosis of early brain tumors.

Don't expect cartilage to show as such.

Don't expect ruptured ligaments to show as such.

Don't expect nerves to show.

Don't expect diagnosis as to the character of pelvic tumors.

Don't expect a differential diagnosis between a large empyema and hydrothorax.

Don't expect gallbladder pathology to be demonstrated in every case.

Don't expect a diagnosis of pregnancy under three months.

In general don't expect diagnosis of diseases which cause no major organic change. Acute chest diseases cause definite changes which give distinguishing shadows.

Don't be afraid of incurring x ray burns in diagnostic work.

Don't fear injury to the retina and optic nerves or other nerves from radiographic exposures. Even in treatment work nerve tissue has proven very much more resistant than other body tissues.

Finally, and very important, don't expect an accurate diagnosis of fractures by fluoroscope only. It shows only major details. Small fractures, "greensticks" and impactions are not dependably examined without plates. In fact, no fracture is adequately shown fluoroscopically.

Diagnosis of Tuberculous Spondylitis in the Röntgenogram.—H. J. Schmidt (*Schweizerische medizinische Wochenschrift,* August 28, 1924) asserts that few of the roentgenological signs of tuberculous spondylitis are pathognomonic. The early stages of the disease cannot always be recognized on the plate. In the presence of caries at the level of the thoracic vertebræ, eighty per cent. of the cases show suppuration at the necropsy, sixty-six per cent show the presence of abscess roentgenologically, while only twenty-five per cent. can be recognized on purely clinical grounds. An absolute roentgenological diagnosis can be made only in the late stages. It is only rarely that the roentgen diagnosis cannot be made for one to two years and in the large majority of cases the roentgenogram is characteristic after four to six months.

Animal Tumor Cells Made Resistant to X Rays by X Rays.—S. Russ (*Lancet,* March 22, 1924) found that by subjecting tumor cells to increasing doses, a number of steps in the action which x rays have upon these tumor cells beginning after moderate doses with a slowing up of its normal rate of growth, can be discerned. With greater doses the tumor acquires an increased resistance to the x rays. When doses very near to the lethal dose are given degenerative features appear in the cells which can be recognized microscopically.

Asthma and Hyperthyroidism Treated by Radiotherapy Over the Thyroid Gland.—F. Widal and P. Abrami (*Presse médicale,* May 31, 1924) bring forward fresh proof in support of their belief in the endocrine origin of certain forms of asthma. The four cases they report present a striking analogy. All are cases of essential asthma, independent of any detectable alteration in the respiratory apparatus, and occurring in women who present the typical picture of Basedow's disease. These four patients improved remarkably and were perhaps cured by radiotherapy over the thyroid body.

RESPIRATORY DISORDERS

Pneumonia in Children.—William T. Freeman and Lewis D. Hoppe (*American Journal of Diseases of Children,* September, 1924) report twelve cases of pneumonia in infants and children treated by intravenous injections of mercurochrome—220 soluble, together with animal experimentation, showing that following the injection of mercurochrome the fluid squeezed from the lungs inhibits the growth of bacteria.

Of the twelve cases of pneumonia, seven were bronchopneumonia and five were lobar in type. Two patients died. In one, death was inevitable before the drug was given. In the other case, with cyanosis of unknown origin existing for several years, the patient showed definite improvement at first but later failed to respond to treatment. In seven cases one injection was all that was required. Three cases required two injections and in two cases three injections were given. The average dose was 0.005 gm. to the kilogram of body weight, using a one per cent solution.

Marked clinical improvement usually occurs a few hours after the injection, and this improvement sometimes occurs without any marked change in the temperature or pulse rate. These cases of pneumonia treated with mercurochrome ran a much shorter course than cases of pneumonia of the same severity where this drug was not used. The systemic reaction is mild in children. The results obtained by this drug are often spectacular. The course of the disease is sometimes shortened and often abruptly terminated.

Adrenalin Applied to the Larynx in Grippe Croup.—In influenza croup there is a high grade of hyperemia of the small bloodvessels and capillaries with edema and almost no exudative processes. On the basis of the fact that adrenalin produces an anemia and detumescence of tissue in mucous membranes and wounds, W. Arnold (*Monatsschrift für Kinderheilkunde,* September, 1924) tried the use of adrenalin in severe cases of grippe croup at the site of the swelling directly, namely, the entrance to the larynx, as repeated subcutaneous injections of adrenalin as well as inhalation of adrenalin did not produce the desired results.

The technic is as follows: A piece of cotton as large as a bean, with a cord attached and pulled under the nail of the index finger, was moistened with 0.5 to 1.0 c.c. of 1:1000 adrenalin solution. The cotton was then inserted in the same manner as the procedure of intubation is carried out. The index finger of the other hand is used to depress the

ase of the tongue to prevent the contamination of the adenalin with mucus. The cotton is pushed past the epiglotis and applied to the vocal cords with slight pressure, so hat the adrenalin also reaches the deeper parts of the larynx, whereupon the attack of coughing shows that it is properly pplied. The mucus from the pharyngeal wall should be riped away.

This test may also be used as a differential sign between rippe laryngitis and laryngeal diphtheria, as the stenosis a diphtheria does not recede after the local application of drenalin. Diphtheria is chiefly an exudative process, whereas the exudative process is practically missing in grippe roup. In the latter the adrenalin produces anemia and etumescence, which is not the case in diphtheria. Even hough the result is only a momentary one, the author had to epeat the adrenalin treatment only once in his cases.

Precipitation of Crises in the Treatment of Pneumonia.—F. M. Gardner-Medwin (*British Medical Journal,* July 12, 924) advances the following conclusions:

1. Pneumonia is the result of lowered resistance.

2. Lowered resistance is coincident with, if not caused by, eucopenia.

3. Leucopenia is the result of a toxin, which temporarily paralyzes the power of the system to respond to the chemoactic call of bacterial invasion.

4. Sodium nucleinate, injected intramuscularly, has the power to overcome this disability and to call out the reserves of leucocytes stored in the marrow, converting the leucopenia into a leucocytosis, thereby precipitating the devolution of the disease.

5. The effect of sodium nucleinate is independent of the duration of the illness, provided the patient is not in a dying condition before it is administered.

6. The action of this remedy is greatly facilitated by intensive alkalinization of the system by the administration of large doses of sodium bicarbonate.

7. Lobar pneumonia reacts more typically and satisfactorily than does bronchopneumonia.

Lipiodol in the Diagnosis of Bronchiectasis.—P. F. Armand-Delille and Alan Moncrieff (*British Medical Journal,* July 5, 1924) obtained clear röntgenograms of the bronchi by previously injecting lipiodol into the bronchi. Bronchial dilatation of even slight degree is definitely shown and localization of vague shadows becomes very much simplified. Cases of frank tuberculosis should not be submitted to this method, for the resulting congestion may be harmful. In many cases its use is invaluable. The lipiodal is injected into the trachea through the cricothyroid membrane under novocaine anesthesia. About ten c.c. are necessary to inject the bronchi of a child seven to fourteen years and the injection is made at the rate of three c.c. a minute. The röntgenogram is then taken immediately after the injection.

Epidemic Pleurodynia.—David Greene (*Archives of Pediatrics,* May, 1924) describes an epidemic disease which, because of its symptomatology, may best be called epidemic pleurodynia. This condition is characterized by the sudden onset of pain in the chest or upper part of the abdomen, fever and moderate prostration. Its etiology and nosology cannot be definitely stated. There are, however, several features about the disease—its epidemicity, abrupt onset, cyanosis, one to three days fever, leucopenia and moderate prostration—which somewhat resemble influenza. On the other hand, the acute pain in the chest which is the most striking symptom and the absence of generalized aches and pains and the absence of an inflamed nasopharynx are atypical of influenza.

The Common Cold.—R. L. Cecil (*Medical Clinics of North America,* July, 1924) emphasizes the value of general hygienic measures in the prevention of acute respiratory infections, such as raising the vitality of the patient, the avoidance of gastrointestinal disturbances, proper ventilation of the rooms, suitable clothing, the removal of focal infections, and the care of the circulatory and nervous systems by massage, baths and exercise. The patient's resistance is best raised by the use of autogenous vaccines.

The treatment of an existing cold includes certain fundamental principles: 1, rest, preferably in bed; 2, simple diet; 3, catharsis; 4, the use of mild analgesics, such as aspirin or pyramidon. The old fashioned treatment, consisting of hot bath, lemonade and whiskey, and a full dose of Dover's powder, still has many advocates. Locally, the author employs a twenty-five per cent. aqueous solution of argyrol and it should also be used as a gargle. Quinine is not very efficient. Vaccines have no value in the treatment of an actual attack. The results with the chlorine gas treatment with an atmosphere containing 0.02 mg. of chlorine to the litre were satisfactory in acute and chronic rhinitis, influenza and whooping cough; better results were obtained in acute laryngitis and acute bronchitis.

Pneumonia from the Viewpoint of the General Practitioner.—S. B. Wolff (*New Orleans Medical and Surgical Journal,* July, 1924) bases his treatment on an attempt to overwork the three channels of elimination, the skin, bowels and kidneys, thereby saving the lung until the crisis or lysis. The patient is kept in a well ventilated room, avoiding extremes of cold. When seen early a calomel and soda purge is ordered, with podophyllin added in case of great constipation. Hot mustard footbaths are ordered with minute instructions as to their administration so as to bring about perspiration. Soda citrate in from fifteen to thirty grain doses every two hours furnishes an alkaline diuretic and a mild diaphoretic. Quinine is given to adults, twelve to fifteen grams a day, and its effect on the temperature noted; if it is found beneficial it is continued, otherwise discontinued. If there is no change in temperature conditions on the fifth or sixth day it is well to be suspicious of complications, such as nonsymptomatic otitis media or pyelitis, especially in children; for the former an aural examination is necessary, for the latter, citrate is discontinued and urotropin ordered. A mild cough mixture is given when the cough is annoying, but properly administered hot mustard baths serve as sedatives, especially in children. In the early stages aspirin is of service, in conjunction with an ice cap, to reduce fever. The writer has not used digitalis much, but has no objection to it, as it is a good heart tonic and a useful diuretic. Strychnine is also of service as a general tonic. Diet should be light and nutritive; liquids, such as broth, fruit juices, malted milk, and the various mixtures of alcohol and beef juice. Nourishment is ordered every two hours.

Vaccine Treatment of Ozena.—Kozo Sagakami (*Lancet,* June 7, 1924) draws the followng conclusions from the experimental results obtained so far: As various diseases of the nasal passages present a close resemblance to ozena, the effectiveness of the vaccine treatment of ozena patients can only be determined by applying the autogenous vaccine produced from the bacteria carried by the patient himself, and after the species of such bacteria have been ascertained. Bacteriological observations show that most ozena patients suffer from a mixed infection by the coccobacillus and gram positive mucus producing bacilli; therefore the application of mixed vaccine derived from these two kinds of bacteria appears reasonable. Injections of coccobacillus vaccine and mixed vaccines are the most reasonable treatment of ozena cases. Ozena patients generally show a decreased number of red and white corpuscles, and this condition does not change after vaccine treatment.

Vaccines in the Treatment of Purulent Pleurisy.—G. Vallet and A. Augé (*Bulletin de l'Académie de médecine,* July 29, 1924) report twelve cases of purulent pleurisy, of which eleven were known to be streptococcic, met with during an epidemic of grippe. Of the six who did not receive vaccine, but were treated by ordinary procedures, four died; in three of these an operation had been performed. All of the six cases treated with vaccine recovered; three of these cases were operated. The vaccine used was an autogenous preparation from cultures on bouillon with ascites fluid; after centrifugation the germs were diluted to 500 millions per mil in chloroform water. The number of injections, except in two cases, ranged from five to nine; one to two mils were given each time. In the two other cases, as an emergency measure, "ptysmatherapy" was practised, a suspension of the patients' sputum in chloroform being administered at the start and treatment then continued with a vaccine. In the last two cases treated a pyovaccine was prepared at the bedside by suspension of two to three mils of freshly withdrawn pus in a little chloroform. In both cases the condition cleared up almost immediately after the injection. The writers conclude that vaccine therapy is a valuable therapeutic agent in purulent pleurisy. It enables the surgeon to select the time of operation so that it shall be performed under the most favorable conditions, that is, when the general manifestations and pulmonary lesions have definitely improved.

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Medicolegal Notes.

RIGHT TO ENJOIN COMPETITION ON TERMINATION OF ASSISTANT'S CONTRACT

The Minnesota Supreme Court holds, Granger v. Craven, 199 N. W., 10, that it is but a reasonable protection of a legitimate interest for a physician and surgeon, having a long established practice, to require of one whom he is about to employ as an assistant in such manner as to give him access to the acquaintance and confidence of patients, a covenant not to enter into competition with the employer for a reasonable time after the relationship is terminated. Where, in such a case the assistant covenants, in the event of the termination of the employment, not to open an office in the same city (containing not over 20,000 population), nor within twenty miles thereof, for a period of three years, it was held that the protection was reasonable and the covenant might be enforced by injunction. The court also says in its syllabus: "Where a professional man is employed to take over an entire department of the employer's practice, it is so clear that he will acquire the confidence and adherence of many of the patients that irreparable damage to the employer will be presumed to arise from the employee's breach of the covenant not to establish a competing practice for a period of three years. Relief in such a case will not be denied because the employer had the right to terminate the contract at any time upon thirty days' notice, the employee having the same right and the contract having been performed and the employment under it continuing for over two years."

LEAVING SPONGE IN WOUND HELD NEGLIGENCE

The Texas Court of Civil Appeals holds Moore v. Ivey 264 S. W., 283, that where, in a malpractice case, the jury found, upon sufficient evidence, that the defendant left a sponge in an incision in plaintiff's body after an operation warranted a further finding that such act constituted negligence on the part of defendant.

EVIDENCE AS TO LEAVING GAUZE SPONGE IN WOUND

The Oklahoma Supreme Court holds, Mayberry v. Myers, 229 Pac., 563, that the general rule that, in law actions, sought to be reversed on the sole ground that the evidence was insufficient to support the verdict, the judgment will be affirmed where there is any evidence reasonably tending to support the verdict, is applicable in an action for failure to remove a gauze sponge from the abdominal cavity after performing a surgical operation and before closing the incision, where the operation was performed by the surgeon in his own hospital and surrounded by nurses in his employ and associate physicians.

PRIVILEGE STATUTE NOT WAIVED BY PLAINTIFF'S TESTIMONY

The Minnesota statute, §8375, G. S., 1913, forbids a physician from disclosing, without the consent of his patient, information acquired in his professional capacity and necessary to enable him to act in that capacity. The Minnesota Supreme Court holds, Polin v. St. Paul Union Depot Co. 199 N. W., 87, that a plaintiff did not waive this privilege by bringing an action to recover for injuries, and testifying at the trial as to the injuries and that a broken bone in his leg had been set and the leg placed in a cast by the physician.

REGENTS OF STATE UNIVERSITY HELD NOT LIABLE FOR NEGLIGENCE OF EMPLOYEES OF UNIVERSITY HOSPITAL

The Michigan Supreme Court holds, Robinson v. Washtenaw Circuit Judge, 199 N. W., 618, that the regents of the University of Michigan were not liable for the negligence of a surgeon resulting in injuries to a surgical patient in the University hospital, by permitting a sponge to remain in a wound, under the rule that charitable institutions supported wholly or in part by a state or municipality are not liable for personal injuries suffered through the negligence of an employee, servant or agent of thei nstitution. The hospital is an adjunct of the medical department of the University, which is a state educational instrumentality maintained by the public at public expense, controlled and operated by the Board of Regents, a governmental agency which receives in trust and expends the public money devoted to that purpose. The court was of opinion that denial of liability as to the regents could safely be rested either on the ground that the institution was a state instrumentality or that it was a charitable institution.

STRAIN AGGRAVATING HERNIA NOT WITHIN ACCIDENT POLICY

The South Carolina Supreme Court holds, Young v. Continental Casualty Co., 122 S. E. 577, that the direction of a verdict for the insured in an action on an accident policy for an injury resulting in hernia, claimed to have been caused by an unusual strain in reaching up to get a book down from a high shelf was error in view of the plaintiff's admission showing the presence of hernia six months before. If a person suffering from some weakness or disease subjects himself to conditions which would not injuriously affect persons in ordinary health, but should be dangerous to him, it would not be due to an accidental cause.

SICKNESS FROM INHALING IRON DUST FROM LATHE

The Illinois Supreme Court holds, Peru Plow & Wheel Co. v. Industrial Commission, 311 Ill. 216, 142 N. E. 546, disability arising from an employee's continued breathing of iron dust in his particular occupation of operating a lathe used in boring out or enlarging the inside of metal wheel hubs, where there was not one circumstance, incident or time showing the starting place of the disability, was not the result of an accident but of an occupational disease.

CAUSE OF LOSS OF EYE, DISEASE OR HEMORRHAGE FROM STRAIN

In proceedings for compensation for injury to claimant's left eye, alleged to have been caused by strain in doing some heavy lifting, or in wielding a heavy hammer, causing hemorrhage in the eye, resulting in the loss of the sight thereof, one physician testified that the causes alleged could be the immediate cause of the hemorrhage which he discovered on examination. Two physicians, who also examined the plaintiff at other times testified that they did not discover any hemorrhage in the eye, and that, in their opinion, the condition of the eye was the result of disease and not the result of hemorrhage.

The Indiana Appellate Court, J. H. Hardin Co. v. Crowe 143 N. E. 710, said that were it permitted to weigh and decide in accordance with the preponderance of the evidence it might reach a conclusion different from that of the Industrial Board, which awarded compensation; but, as the award was sustained by competent evidence, the Supreme Court on appeal is not permitted to weigh evidence.

FIBROID TUMOR NOT COVERED BY POLICY EXCEPTING DISEASE NOT COMMON TO BOTH SEXES

The Georgia Court of Appeals holds, Riley v. American Nat. Ins. Co., 123 S. E. 33, that a health and accident policy providing that it did not cover any loss resulting from any disease "not common to both sexes" did not cover a fibroid tumor, the undisputed evidence being that men cannot have fibroid tumors.

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The Mechanism of Disease

A Preliminary Communication

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The treatment of disease has been always empirical and, although facts about disease have been discovered, there have been few fundamental biological principles as yet laid down for disease processes, or for the mechanism of drugs. A drug was used because experience proved its value, not because its mechanism was known. Our aim in this paper is to report a preliminary communication of our method for the study of disease, biologically considered.

The study of disease is the study of the reciprocal relation of the apparatus, protoplasm and the force, energy. The unit of protoplasm is the cell. The apparatus, protoplasm, by its reactions, produces the changes and activity which result in the body processes. All action of protoplasm depends upon the energy content of its molecules and protoplasm is nothing more than an apparatus for transforming energy into living processes. The availability of the energy depends upon the requisite configuration of electrons in the atoms of the substances, inorganic or organic, introduced into the body cells and medium from the environment.

All energy comes from the sun by means of plants, (chlorophyll) and animals which live on these plants, and is absorbed into the human system as food, carbohydrates, proteins, lipins, etc. These substances are most of them nonpolar and become polar when they are associated with inorganic substances or other polarizing substances, as in the processes described by Donnan's law of membrane equilibria.

The action of those polarized substances depends upon the amount of basicity or acidity—the hydrogen ion concentration. To quote Loeb (1), "The results of our work lead to the conclusion that there is only one source of colloidal behavior, namely the Donnan equilibrium." (p. 285.) Again, "When a colloid substance used is an amphoteric electrolyte, the addition of a little acid or alkali to the isoelectric substance increases the osmotic pressure, the potential difference, viscosity, stability of the solution and the swelling of the gel." (p. 277.) It is quite possible that Loeb's conclusions are too sweeping in regard to the processes of Donnan's equilibrium, but there is no doubt that he is right in the main and that the key of human protoplasmic behavior is that of action upon the semipermeable cell membrane or surface film of the colloid emulsoid system.

Donnan's law is as follows: When a membrane separates two solutions of electrolytes, one of which contains one ion which cannot diffuse through the membrane, while all the other ions can diffuse through the membrane, the result will be an unequal distribution of diffusible ions on the opposite sides of the membranes. At equilibrium, the products of concentrations of each pair of oppositely charged diffusible ions are the same on opposite sides of the membrane (such as cell membrane). This unequal concentration of the diffusible crystalloidal ions must give rise to potential differences, and osmotic forces which furnishes the explanation of colloidal behavior.

Colloid substances (and the protoplasm of the body must be considered as a polyphasic colloid system of the emulsoid type) are altered in their behavior by the relation of acids and bases. Bases and acids are considered, in our study, according to the definition of Lewis (2) that "a basic substance is one which has a lone pair of electrons which may be used to complete the stable group of another atom, and that an acid substance is one which can employ a lone pair of electrons from another molecule in completing the stable group of its own atoms, "or the basic substance furnishes a pair of electrons for a chemical bond, the acid substance accepts such a pair." (p. 142.)

The influence of basicity and acidity may be seen in the case of the substance $C_6H_5So_2OH$ which may be regarded as a derivative either of sulphuric or sulphurous acid, namely, a, sulphuric acid in which one hydroxyl group is replaced by phenyl, b, sulphurous acid in which one hydrogen is replaced by phenyl. In accordance with assumption, a, we should assign to sulphur the polar number +6 and to phenyl as a whole, the polar number —1. With assumption b, we would give +4 as the polar number of sulphur and +1 as that of phenyl. Now, it is usually taken for granted that, on hydrolysis, a positive atom adds hydroxyl and a negative atom adds hydrogen, but, when we apply this criterion to the case before us, we find the substance hydrolyzes in acid solution to give benzene and sulphuric acid, and, in a basic medi-

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um, it gives phenol and subphurous acid (v. Lewis, p. 70). Many other examples of such influence of the action of basicity and acidity may be given, as the action of phosphoric acid as a monovalent, bivalent or trivalent acid under different conditions.[1]

The bases, acids and salts of the body thus affect the colloids of the protoplasm and this influence is in a definite order according to their surface tension and other intrinsic properties.

Besides the number of charges carried by the ion, the efficiency of the ion is measured by the voltage of the ions, that is, by the tendency of the ion to give up its charge or by the amount of available energy of the ion. There are always two factors in energy, the quantity factor, and the intensity factor. Just as in an electric current, the amount of work it can do is measured by the amount of current and the voltage, so, in an ion, the amount of work it can do is measured by the number of charges and by the voltage or intensity factor of the charge.

The intensity factor in the human system is the hydrogen ion concentration, or pH (hydrogen potential) and the quantity is the polar substances, the inorganic salts of the cells and serum, which produce the polarization of the colloid substances. Blood must be considered only as a more mobile form of body tissue, but still a colloid emulsoid system.

There are then, three factors in the energy side of the problem—the inorganic salts, the hydrogen ion concentration, or to use loose terms, the basicity or acidity and the food source of the energy which must be made available by the first two in the process called metabolism.

These factors influence the unit of the body, the cell, so that it becomes more or less permeable, has more or less viscosity, has more or less conductivity, increases or decreases in osmotic pressure and in swelling or contraction accordingly as it does in experimental colloidal solutions.[2]

The cell is influenced in one direction or another, and, in the human body, this influence, according to our researches, is directed through the vegetative nervous system, the vagus-sympathetic anion-kation balance.

This is the mechanism whereby the changes in body salts and hydrogen ion concentration modify the energy derived from outside sources (the food, etc.) to accompany the changes in the cell, and, with these changes, alteration in the protoplasmic metabolism and body processes. The anion state is reciprocally correlated with the vagus state and the kation with the sympathetic state.

The vegetative nervous system, as is well known, controls the unconscious processes of the body, the lungs that breathe, the heart that beats, the kidneys that secrete, the intestines that move, and the osmosis in the cell is coincidently altered. The processes of the vegetative nervous system can best be studied in the action of the smooth or involuntary muscle over which it has direct control. The striated muscle of the heart is involuntary muscle, and is, indeed, a variety of smooth muscle. The vegetative nervous system consists of two parts, the vagus and sympathetic. The vagus inhibits the heart and stimulates the action of the intestines and pupil. The sympathetic stimulates the heart and inhibits the action of the musculature of the intestine, but stimulates the intestinal sphincters.[3]

These cells of smooth muscle act and react as do single cells used in biological study and the action of the smooth muscle of the intestine gives the direct index of metabolism and physiological processes. The action of the smooth or involuntary muscle of the body may be studied in the pupil, the heart and the intestine. In our study, we have found that it is best studied in the action of the stomach and intestines, the largest unit of smooth muscle in the body and capable of great changes and alterations, as viewed by the fluoroscope and recorded by radiographs after the barium sulphate meal. The rhythm, rate and amplitude of the stomach and intestines may be studied and recorded under uniform conditions, and, in the absence of drugs, purgatives, or other substances, so give a record and estimate of the varying influence of the vagus and sympathetic parts of the vegetative nervous system. These findings may be correlated with observations upon the heart, temperature, hydrogen ion concentration of the blood, reaction of the urine, stool and saliva, blood examinations and other materials, all of which we have found of use in the estimate of the action of energy and its influence upon the vagus-sympathetic balance in metabolism and disease. Blood chemistry, particularly nonprotein nitrogen and plasma protein estimation, is also of value. The reactions of the stool and mouth we consider suggestive.

TYPICAL KATION OR SYMPATHETICOTONIA	TYPICAL ANION OF VAGATONIA
Decreased smooth muscle reaction	Increased smooth muscle reaction
Higher pH	Lower pH
Alkaline mouth	Acid mouth
Alkaline stool	Acid stool
Alkaline urine	Acid urine
Barium retained in colon	Barium passes out quickly
Constipation	Spasticity of colon
Morning temperature lower than normal (when no infection)	Morning temperature higher than normal (when no infection)
Higher blood pressure	Lower blood pressure
Higher pulse rate	Lower pulse rate
Regular pulse	Arrhythmia
Higher red cell count	Lower red cell count
URINE	URINE
Chlorides lessened	Chlorides increased
Albumin	Small amount albumin
Higher specific gravity	Lower specific gravity
Lowered sugar tolerance	Higher sugar tolerance
Lessened urine output	Increased urine output
Warm hands	Cold hands
Large pupil	Small pupil

[1]Examples and explanation of this may be found in the books of Lewis and J. Loeb and in the writings of Langmuir, *J. Am. Chem. Soc.* 1916, 38,22: I, 1919, 41, 868: II, 1919, 41, 1543 and 1920, 42, 274.

[2]These phenomena may be well understood by reference to J. Loeb's book, *Protein Behavior*, to the book *General Cytology*, University of Chicago Press, 1924, written by the biologists who spend the summer at Woods Hole, Mass., edited by Cowdry, to the book of R. S. Lillie, *Protoplasmic Action and Nerve Action*, University of Chicago Press, 1923, to Mathews' book *Physiological Chemistry*, Wm. Wood and Co., New York, 1921, to Osterhaut's book, *Injury, Recovery and Death*, to the writing of Dr. True, professor of botany in the University of Pennsylvania, and to the latter we wish to express our thanks for encouragement and assistance in the colloid problem.

[3]The study of the vegetative nervous system and its action may be found in the works of Heinrich Higier, *Vegetative Neurology*, Nervous and Mental Disease Publishing Co., New York, 1919; Eppinger and Hess, *Vagatonia*, Nervous and Mental Disease Publishing Co., New York, 1915; Sherrington, *The Integrative Action of the Nervous System*, Yale University Press, New Haven, 1920; W. Langdon Brown. *The Sympathetic Nervous System in Disease*, Oxford University Press, 1920; W. H. Gaskell, *The Involuntary Nervous System*, Longmans Green, 1916.

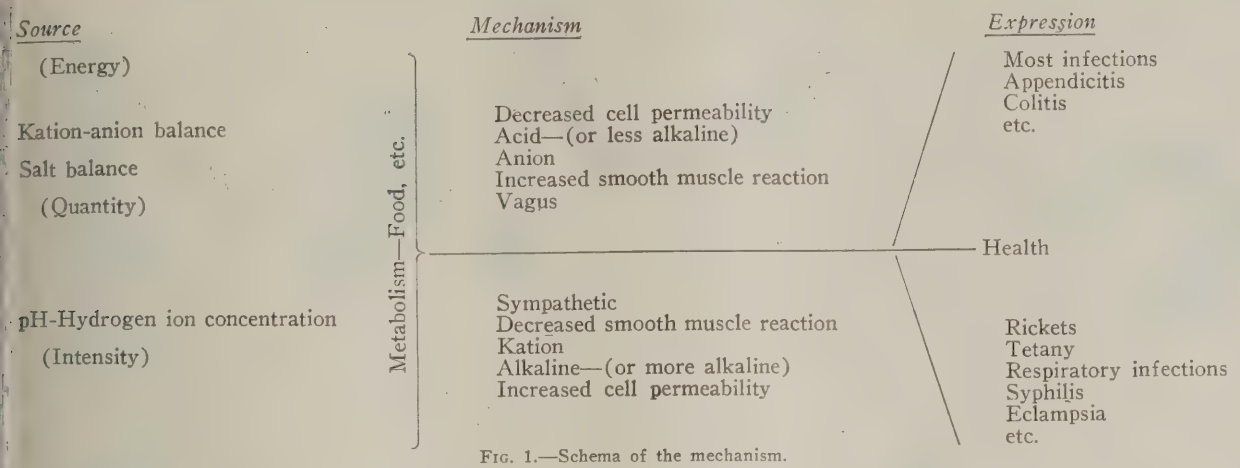

FIG. 1.—Schema of the mechanism.

In the division between the kation and anion sympathetic-vagus state, dependence is not put alone upon these criteria, but the following clinical signs are also of value. It must be understood that these signs are those found in the typical or extreme kation and anion conditions and that all intermediate grades are found. The smooth muscle reaction is the most delicate and accurate of these tests.

We have found from a study of the rhythm, rate and amplitude of the intestine and stomach that these vary in direct proportion to the hydrogen ion concentration of the blood and we show this in x ray pictures, and that changes can be produced in the intestine by the injection and ingestion of various salts of sodium, potassium, magnesium and calcium, as shown by the accompanying radiographs. Chemical variations in the body fluids can affect the vegetative nervous system and, in this way, the entire system of smooth muscle in the blood vessels, heart, and digestive tract.

In our x ray pictures, being still pictures, it is possible to show only the amplitude of the large intestine which corresponds with the hydrogen ion concentration of the blood. The rate apparently goes, more or less, with the force, while the rhythm appears to be governed by both these facts. The fluoroscopic study is equally important with radiographic record.

We have also found that certain diseases show changes in the large intestine and hydrogen concentration of the blood according to vagus or sympathetic preponderance and that these diseases may be classified into one or other group according to such preponderance of one or other part of the vegetative nervous system.

The proper balance of the vegetative nervous system is necessary to health and is an expression of profound body changes in the cell protoplasm. Disease is the deviation from this balance and is an expression of the changes in the apparatus, protoplasm, and the force, energy, and these changes may be recorded through the action of the smooth muscle of the body. We have called this phenomenon the *smooth muscle reaction.* In these changes, which show the preponderance of one or other side of the vegetative nervous system, we would deprecate the use of the terms, vagatonia and sympatheticotonia, as being limited and somewhat misleading and prefer the terms, *anionic,* to express the phenomena associated with vagus preponderance and increased *smooth muscle reaction* and the term, *kationic,* to express the phenomena associated with sympathetic preponderance and decreased smooth muscle reaction. We believe that the action of these kations and anions in influencing the charge of the colloids is the factor in producing change in the cell, and so alteration in metabolism which results in disease.

We would express the action of the two factors, protoplasm and energy, in the accompanying diagram (Fig. 1). This schema will show better than any description the results of our researches. It is impossible for us to reproduce here all our x ray pictures and experiments, amounting now to many hundreds, and extending over two years, but we wish here to detail sufficiently to sustain our theory in order that others may take up the study of disease from this point of view. If our contention is correct (as we believe that we have sufficient proof that it is), it is obvious that all diseases must be investigated from this point of view as it will have enormous bearing upon their treatment. We have extensively investigated mental disturbances and gynecological and surgical conditions after this method and the results are too elaborate to be detailed here, but we believe that it will have a great bearing upon the understanding and treatment of these conditions. We believe that the action of drugs and salts must be studied after this method (and we have made a number of such studies) for this is the mechanism of their action. We have found the method valuable in the study of psychic disorders as it is possible to correlate the integration of the vegetative nervous system with the mental deviations.

The metabolism in the cell changes according as the condition is kationic or anionic. In the kationic state, the cell is more permeable and the plasma diluted. A good example of this is in eclampsia where there is, in the preeclamptic state, lessened calcium, dilution of the plasma, and edema. Kationic states where edema exists may be helped, for example, by the salt free diet which lessens the intake of the kation, sodium, and so reduces the permeability of the cell. The diseases we have studied seem to arrange themselves in degrees of deviation from the kation-anion balance, but we are not prepared at present to make any classification in this regard.

We have found the various salts, sodium, potassium, magnesium and calcium, to have effect upon the kation-anion balance in that order. Sodium and potassium in certain combinations act as kations,

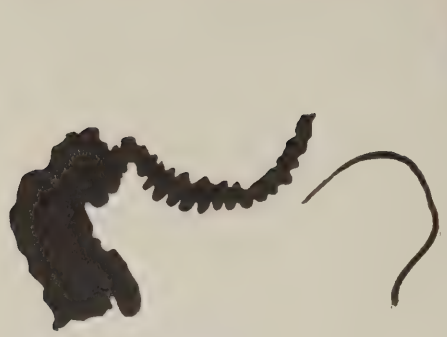

Fig. 2.—Colon with pH of 7.3 in the blood.

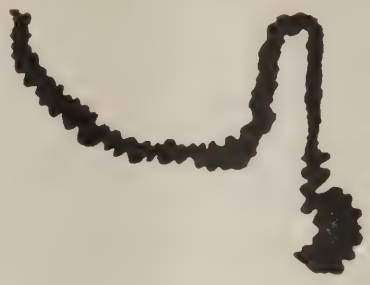

Fig. 3.—Colon with pH of 7.34 in the blood.

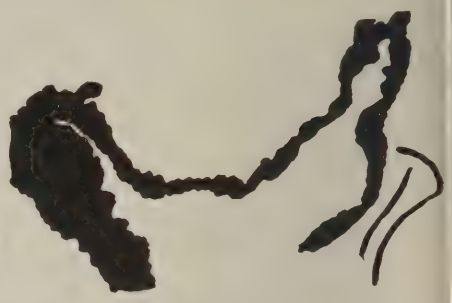

Fig. 4.—Colon with pH of 7.35 in the blood.

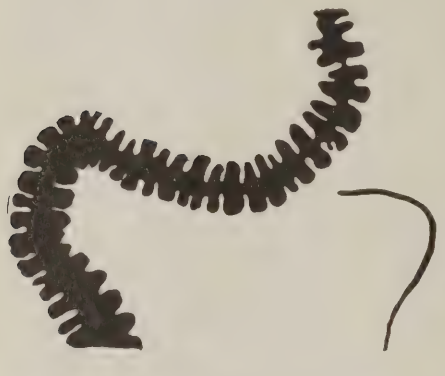

Fig. 5

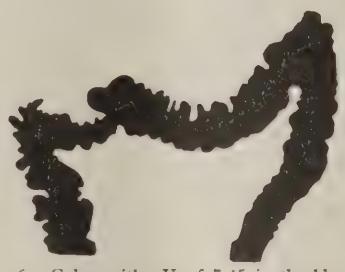

Fig. 6.—Colon with pH of 7.45 in the blood.

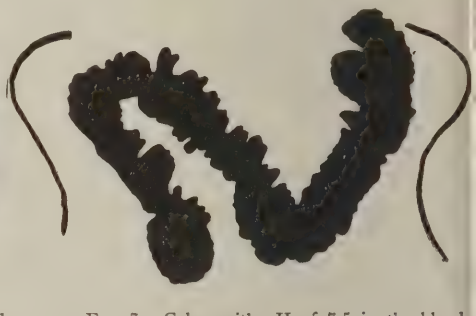

Fig. 7.—Colon with pH of 7.5 in the blood.

Fig. 5.—Colon with pH 7.4 in the blood. (According to our experience a pH of 7.4 plus, accompanies normal intestinal innervation and we would consider that the normal pH was a little upon the plus side of 7.4, but rather nearer 7.4 than 7.45) The pictures shown here have been chosen to illustrate rather wide changes in the pH for the sake of reducing the number of illustrations.

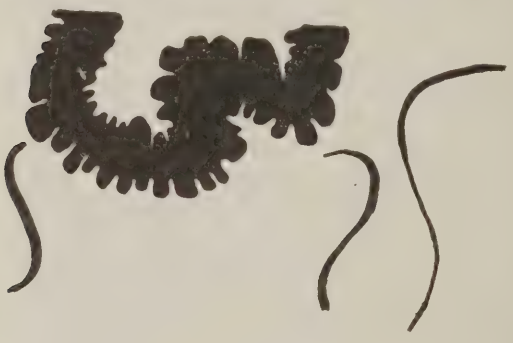

Fig. 8.—Colon with pH of 7.6 in the blood.

Fig. 9.—Colon with pH of 7.7 in the blood.

Fig. 10.—Colon with pH of 7.8 in the blood

while magnesium has a more indefinite action and most combinations of calcium, as the lactate and chloride are distinctly anionic. The acid salts, such as sodium acid phosphate, etc., seem to act as buffer salts. Sodium and potassium salts are, in general, antagonistic to calcium salts. The same criteria may be applied to the smooth muscle cells as are applied to single cell organisms in biology or to emulsions or colloids, namely that the salts of potassium, sodium, magnesium or calcium have certain effects in respect to permeability, conductivity, inhibition, potential differences, etc., depending on their electrolytic state which is affected by the hydrogen ion concentration of the fluid. In other words, certain of the salts will work in a medium of a certain degree of acidity and, as acidity changes to alkalinity, then certain other salts go into action and produce their effects. The degree of contraction or relaxation of the smooth muscle is an index of these various physiological states.

Our conclusions are that the processes of disease are the expression of the reciprocal action of the protoplasm and energy. Deviation from the proper balance, health, is marked by deviation from the kation-anion vagus-sympathetic balance of the vegetative nervous system. This deviation can be studied by the fluoroscope and recorded by radiographs of the stomach and intestines and this phenomenon is called the smooth muscle reaction.

The smooth muscle reaction varies with the hydrogen ion concentration of the blood and the kation-anion, acid-base balance. Experimental changes in the smooth muscle reaction and the vagus-sympathetic balance can be produced by the ingestion and injection of various salts. Certain diseases, as rickets, colitis and others, show a deviation from the smooth muscle reaction and the vagus-sympathetic balance. The sympathetic preponderance is called *kationic,* and the vagus preponderance is called *anionic,* because, in disease and experimentally, these

conditions go together. Disease is a deviation of the kation-anion, vagus-sympathetic, the salts and hydrogen ion balance and, inasmuch as certain diseases studied fell toward one or other side of this balance, so, all disease should be studied after this method as it may have a great bearing upon treatment.

There cannot be alteration in the body processes unless these are directed by the vagus sympathetic mechanism as this controls the heart that beats, the lungs that breathe, the intestines that move, the kidneys that secrete. . . . Disease is a deviation from normal of such body processes and is, therefore, dependent upon the vagus-sympathetic balance and this is an expression of corresponding changes in the protoplasmic cell itself. A method of the study of disease has been outlined which allows the application of biological criteria to the human organism. The smooth muscle cell follows the same principles of change and alteration in regard to viscosity, osmotic pressure, conductivity and potential differences as do the simple biological organisms used by investigators in that science.

ILLUSTRATIONS

These illustrations are made from tracings of x ray pictures over the viewing box. The pictures are taken from the front of the patient. Figs. 2 to 10 illustrate the correlation of the smooth muscle reaction with the hydrogen ion concentration, or pH values of the blood. The important thing in the study of these x ray pictures is the innervation of the colon, the form and arrangement of the haustra, that is the amplitude. These are the phenomena upon which we place importance. It is to be regretted that in still pictures we cannot show the action of the stomach and the small intestine. These are not accidents of filling the intestine, but are uniform and characteristic for each individual condition when the influence of purgatives and drugs is removed. The action of the stomach and small intestine is also of importance, but these are best studied by the fluoroscope and not in radiographs.

The hydrogen ion estimation (pH) has been done by the Hawkins method (3) as modified by Hastings and Sendroy, Jr., (4) and using the bicolor standards with pairs of tubes.

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Spirochetosis Riverensis

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This name has been applied to a serious disease I am describing because of the circumstances and places in which I found it existing, and because of the fact that, as far as I know, this is the first description given, and since its peculiar symptomatology is not yet known to the medical world.

Taking into consideration the appearance and morphology of the organism that causes this disease it could be regarded as a transition between syphilis and Trypanosomiasis gambiensis, but the parasite that produces the disease is not a treponema nor a treponosoma but a robust spirochete larger than the Spirocheta refringens and appearing to have an undulatory membrane.

This disease has not yet been studied in Montevideo where it is being confused with syphilis. However, the Uruguayan medical men realize that a different condition of affairs exists in the north because, from time to time, I heard remarks such as, "how grave, serious and difficult to cure are those cases of syphilis in the frontier," referring to the disease I am describing which exists in the northern frontier of Uruguay, in the Department of Rivera, and in the southern part of Rio Grande, Brazil.

The disease can be safely described as a meningitis of a persistent, chronic type, which, while it does not immediately prove fatal, tends to impair the health to the extent of shortening life and ultimately producing death by the course of intercurrent diseases.

It is produced by a peculiar parasitic organism resembling the Spirocheta refringens in structure, though thicker, and showing very active movement. It is not found in the blood but it circulates freely in the watery fluid of the brain, lakes and ventricles, and probably in other structures. It may, however, be considered a disease allied to syphilis or even a manifestation of polymorphism of the organism that causes it; however, the way the human organism contracts the infection is very different.

In the majority of cases it starts with a gonorrheal infection, although it may be acquired in other ways. The gonorrheal pus does not contain the Spirocheta riverensis, but peculiar nucleated cells which probably undergo transitory variations in the lymphatic tissue before reaching the spinal cerebral fluid.

SYMPTOMS

The human organism reacts much more feebly than in syphilis and the infection is, therefore, much more severe. There is not, as a rule, the socalled rosary chain of lymphatic glands, which is the manifestation of Nature's first reaction against disease. I have seen, nevertheless, but only occasionally, in robust individuals, inflammation of one inguinal gland with tendency to suppuration. This is the exception, however, because as a rule the disease develops slowly and most insidiously as a secondary manifestation.

The most common preliminary symptoms are: general lassitude, frontal headache of neuralgic type, nervous disorders of the heart, and insomnia. In

six months to one year, the characteristic and very typical symptoms of the disease appear. They consist in disorders of vision, tinnitus aurium, and troubles affecting the heart's mechanism with more or less intensity.

EYE SYMPTOMS

These are constant and pathognomonic symptoms of the disease, so striking as to be peculiar to it. They manifest themselves with the increased irritability of the conjunctiva as the country wind will irritate and inflame the eyes of persons who, prior to infection, never suffered from eye troubles. Subsequently a mild form of iritis develops with globular pain and a sensation of fullness. A mild degree of photophobia occurs which becomes more severe, and sensitiveness to strong light may be intense. There is extreme sensitiveness to red color and to lines.

The spirochete is found visible and active in large numbers in the anterior chamber of the eye.

EAR SYMPTOMS

Tinnitus aurium is another constant symptom. It is always present with more or less intensity according to the severity of the ocular phenomenon. The sensation is that of a peculiar ringing or roaring sound in the head. I believe that this is due to the increased cranial pressure and more intense vibration of the perilymph. In advanced cases there may be extreme sensibility to sounds.

HEART SYMPTOMS

There is always an abnormal excited condition of the heart. Palpitation and tachycardia, to a greater or less extent, are always present. It is not unusual to find individuals with a permanent pulse rate of a hundred and twenty a minute.

The high blood pressure and increased hypertension may be considered as Nature's reaction to increase the circulation of the cephalorrhachidian fluid.

HEADACHE

Headache of neuralgic type, frontal lateral, or in the back, may be present in different degrees, but this is not a constant symptom. It is generally felt when awakening in the morning, usually disappearing with the increased activity in the circulation of the brain. Patients with a tendency to insomnia do not complain of headache.

After several years the preliminary symptoms gradually subside denoting a better tolerance by the human organism, and the disease, while compatible with life, becomes chronic, imperilling and shortening life. The affected individual lives in a constant state of overstimulation, has no power of resistance against disease, is debilitated, and succumbs easily to intercurrent diseases. In severe cases the tertiary manifestations develop. They consist in troubles affecting the meninges, cortex and anterior parts of the brain. I have noticed, particularly, that spinal troubles are very rare.

PECULIARITY OF EYE SYMPTOMS

The peculiarity and most striking phenomenon of this disease is that the affected individual can detect the spirochete in his own vision with the naked eye.

By looking at the sky in a gray fundus, in a sort of dreamy way, the patient can see hundreds of thousands, possibly millions, of shining bodies moving quickly before his gaze. This phenomenon is so realistic that it seems as if a cinematographic screen is placed before his eyes, or as if he were making a dark field examination with the microscope. To detect the spirochetes it is necessary, however, to adjust and train the vision accordingly. A special effort must be made to focus the pupil at a fixed and rather short distance. At first this is rather difficult, but later it becomes much easier through practice. This habit of observing the parasite soon becomes automatic, adding to the already abnormal and painful vision an increased congestion of the optic nerve.

In a room illuminated by strong sunlight the infected person can see his own spirochetes, by the proper eye accommodation, fixing his gaze on the wall, floor, or a blank piece of paper. If the paper is divided by crossed lines so as to form square centimetres, the spirochetes can be seen, whiter than the paper, moving actively, three or four of them in each square. The adult spirochetes traversing quickly a space of from two to three square centimetres are plainly visible. Reflected against the wall the size of the Spirocheta riverensis appears large, and larger if reflected against the sky, varying in proportion according to the distance, the eye acting as a magnifying glass.

The Spirocheta riverensis is more robust and highly developed than the treponema of syphilis. It is more active and its motion is not screwlike but rather eellike and it appears to have an undulating membrane. The size, as compared with the normal lymphocytes (any normal person can see lymphocytes in his own vision by the same eye accommodation) is larger than the treponema and resembles that of the Spirocheta refringens, but appears thicker. The protoplasm of this parasite is highly refractive and it has the faculty of absorbing light. Under favorable conditions, in the dark, by closing his eyes the patient can see myriads of shining bodies, namely, the spirochetes with their characteristic motion.

Another kind of microorganism constantly associated with the Spirocheta riverensis can also be seen with the naked eye. This consists of an elongated nucleated cell body moving in an elliptical and crosswise direction. The protoplasm does not appear to be refractive and, therefore, being dark, it is much more difficult to detect. It can only be seen by specially educating the eye, which causes a painful sensation in the optic nerve. The ability of detecting this associated microorganism is acquired after a few years of daily practice in looking at the spirochetes.

Whether this associated bacterium is a transitory form, a proteolithic organism or a unisexual form of the same parasite, is still to be ascertained. The lymphocytes appear greatly increased in number in this pathological condition. The spirochete appears to be astonishingly well endowed with vitality and powers of resistance. Its persistent unchecked culture in the infected organism resulting in the death of the individual is appalling.

In the zone where I detected and studied this disease, in the northern frontier of Uruguay and the southern part of the State of Rio Grande, Brazil, the inhabitants are of Brazilian origin and speak their mother tongue, Portuguese. They differ vastly from

the Uruguayan population south of Rio Negro. The infected zone is a cattle raising section where the well to do people own large tracts of land while the *peones* take care of the cattle.

My impression is that in this zone nearly the whole population is infected with Spirocheta riverensis. About seventy-five per cent. of the men I have examined have a history of gonorrhea. The chronic infection I am describing does not prevent the raising of large families, male births predominating, but the infant mortality is high and the race is poorly developed, undernourished, with little tendency to longevity.

One reason why such an amazingly large percentage of the population is infected is due to the present faulty legislation. The Uruguayan law does not protect the woman in a sufficient way, and when it does protect her the inadequate old Spanish procedure renders the law more ineffective. It was not until September 5, 1914, that investigation of paternity on illegitimate births was permitted.

CHIEF CAUSE OF SPREADING THE INFECTION

The *peona,* a girl of the poorer class, is an actual white slave, found as servant in every kitchen in the *estancias* and residences of the rich. She nearly always has been seduced in early youth and, as a rule, has several children, sometimes each child from a different father. Infected at one time or another, a servant as well as a prostitute, ignorant and without hygienic vigilance, the mistress of the *peon* (farm hand), as well as of the son of the *estanciero* (land owner), or of the *estanciero* himself, in her travels from one kitchen to another she becomes a vehicle of infection and destruction.

Young men get the infection early in life and the old habit of the patient curing himself without consulting a physician, in fact some of them do not even consider the infection worth medical advice, aids in spreading the disease. My impression is that males locally cured of gonorrhea, though with active brain symptoms of the disease, do not transmit the infection. The females, however, once infected will surely and always transmit it to their children. The infection is probably transmitted to offspring by the liquor amnii where the parasite circulates. In fact, children, as a rule, are born undeveloped, with skin eruptions and eye troubles. They frequently die young but the few who survive and recover early in life, according to conditions and resistance, are spared only to be reinfected later. In a great many cases, especially among the rich, the infection persists through life, presenting the characteristic eye, ear and heart symptoms.

The conditions regarding adults are rather different. Spontaneous cures are rare and the disease is persistent and decidedly chronic. Years of practice, observation and study in the affected zone made me familiar with the most common intercurrent diseases that ultimately end the life of the affected individual.

It is necessary to take into consideration the fact that the patient lives in a state of constant overstimulation of the natural defenses set by the human organism against the ever present living culture of the parasite in the liquid bathing the noblest and most important tissue of the body. Even in cases when the infection is well borne, ultimately life will be shortened because of the exhausted condition of resistance and general debility of the body.

In analyzing the possible origin of diseases subsequently associated with this infection, I attach great importance to troubles arising from alterations or damages in the region of the fourth ventricle, especially in the pneumogastric centres affecting the heart, the respiratory and digestive organs. Sudden deaths by heart failure, asthmatic affections, diabetes and hyperchlorhydria are very common in the affected zone.

PNEUMOGASTRIC NERVE INVOLVEMENT

The tenth pair of cranial nerves, or the pneumogastric nerve, from its origin is a motor as well as a sensory fibre and it controls and regulates the most important vital functions and nutrition. Its direct relation with the circulatory, respiratory and digestive systems is well established by the study of anatomy and physiology. Its ultimate association with the sympathetic nervous system, pulmonary, cardiac, and solar plexus which finally anastomosis at the point where it is no longer possible to differentiate the fibre endings, show how it was possible for Claude Bernard, in 1849, to produce artificial glycosuria by his famous puncture of the fourth ventricle. The pancreas directly enervated by splenic plexus receives secretory impulses from the pneumogastric.

My theory is that the diabetes mellitus, so common in the northern frontier of Uruguay, is the result of changes and alterations in the pneumogastric centres due to the deteriorating effect by permanent cultures of spirocheta in the ventricles of the brain, and also, I believe that sudden deaths, asthmatic affections, hyperchlorhydria and other secretory disturbances of the stomach, and other organs of digestion, so common there, respond to the same cause.

Troubles arising from the meninges or from the optic centres are secondary in importance. Defective intelligence and epileptic attacks in children and adults occur occasionally. Defective vision which sometimes terminates in blindness also occurs but in general the eye disturbances are not dangerous, due to the custom of the people of retiring early and saving their eyes from the use of artificial light.

The exterior appearance of the eye of a sufferer from the disease does not show abnormality. Circulative changes are, however, found by the eye specialist. The feature that impressed me most was the delicate condition of the eyes. Any trifling ailment, a light blow or knock, or other troubles will cause serious and permanent injury. This accounts for the large number of *tuertos* in the affected zone. (The name of *tuerto* is applied to an individual who has suffered total or partial loss of eyesight in one eye.)

DEBILITY AND LACK OF BODY REACTION TO DISEASE

In treating the sick one is impressed by the lack of bodily reaction to common diseases. A comparatively mild case of grippe, for instance, may become very serious. The untoward effect of drugs in some cases is extreme. A common knowledge of therapeutics may be upset and its effects doubted because of the unexpected untoward effects of drugs. Therefore, a physician must be very careful and observing when prescribing. A small dose of nux vomica or digitalis may act as an alkaloidal poison. A small

dose of morphine may produce an epileptic attack in persons who never before had had such an attack. A small dose of chloral, luminal or similar drug may produce an attack of dementia in epileptic subjects. The most alarming symptoms may follow the administration of antipyretics, especially in old persons.

CANCER

Cancer in the affected zone is extremely rare. During eight years of practice, covering a large territory, only two cases of cancer came under my observation and these two were in women. I never heard of other cases and came to the conclusion that an infection of Spirocheta riverensis may, to a certain extent, protect against cancer. The individual infected with the parasite lives in a constant state of stimulation, his power of reaction increased to the highest degree, probably sufficient to protect him against cancer, which is acquired by the old and debilitated.

IDIOSYNCRASY TO CHLOROFORM OR ETHER

A condition of exceptional idiosyncrasy in those infected with Spirochetosis riverensis is their inability to take chloroform or ether. Several persons of my acquaintance in Montevideo, operated on for gastric ulcers (hyperchlorhydria and functional disorders of the digestive organs are extremely common) died a few days after the operation. My opinion is that ether or chloroform in these persons produce considerable damage to the nerve cells and a temporary arrest of Nature's process of defense, in consequence of which the number of spirochetes in the brain increases to such an extent that death results.

SUDDEN DEATH

I have recorded several cases of sudden death in infected young persons, caused by exhaustion of the reserve power of the heart and the emotions. One young man while riding on horseback chanced to see a *tatu*. He dismounted from his horse and gave chase on foot, became fatigued, suffered pericardial pain, and died a few minutes later in a neighboring house. Another case was that of a young man out hunting who died while in the excitement of the chase. Another person succumbed when accused of murder.

POSSIBLE ORIGIN OF THE DISEASE

A rich rancher sent a young negro, about twelve years of age, to me for treatment. He admitted having had intercourse with a female dog and the result was a gonorrheal infection accompanied by an extraordinary swelling of the penis. I watched the case very carefully and a few months later I noticed that the three cardinal symptoms—eyesight disturbances, tinnitis aurium and palpitation of the heart—had developed.

WASSERMANN REACTION AND CURE WITH ANTISYPHILITIC METHODS

In the majority of cases the infected persons present a positive Wassermann reaction and are, therefore, submitted to antisyphilitic cures by the local or Montevidean physicians. In the beginning I did the same myself and tried salvarsan, mercury and bismuth, but the results I obtained forced me to drop this method with disgust, regretting the futility of such cures. I have never noticed any real good results from antisyphilitic treatment and in many instances the patient grew worse. Under the action of such treatment I have seen some improvement of the general symptoms, namely headache, insomnia, etc., but only temporarily. In no case have I ever noticed any beneficial effect on the ocular and acoustic symptoms. In many cases I have seen serious and permanent therapeutic injuries by the routine application of an antisyphilitic drug.

An acquaintance of mine in Montevideo was treated with neosalvarsan. Shortly after, spinal paralysis developed, a malady very rare in untreated cases, in fact, I have never seen an untreated patient with spinal trouble. In other subjects blindness developed and in some cases the patient became totally deaf. These afflictions become apparent after the infected persons are subjected to a series of injections. There is no doubt that many deaths have resulted from the unsuitable administration of antisyphilitic drugs.

As an exception to this I found at times that potassium iodide given in small doses had favorable results because, in my opinion, it reacted favorably against the course of the disease by alkalinizing the blood.

I have observed that in cases presenting extreme idiosyncrasy to drugs even if administered in infinitesimal doses, that—contradictory to logical effects—patients bear the disease better than those who are less susceptible to drugs. I remember the case of a young girl having a fainting spell followed by headache and a feeling of intense discomfort which lasted several days, after an absorption of surplus mercury in the amalgam of a tooth filling placed by a dentist. Imagine the result if a strong antisyphilitic drug had been administered!

SPONTANEOUS CURE

I have not the least doubt that spontaneous cures are numerous, but as a rule they occur in children and growing persons. In the adult spontaneous cure is rare and even more so in the aged. Undoubtedly the spirochetes live and die in the human organism and on their reproduction rests the life or death of the individual. The human organism offers little resistance against the fully developed spirochete which moves freely in the cerebrospinal fluid. Nature, however, seems better fitted to combat disease in the young and those in the transitory stage.

The parasite seems to possess astonishing power of resistance and, therefore, the disease is of long duration, chronic, and in the majority of cases fatal. It is interesting to observe and study the various changes in the urine of an infected person at various stages of the disease and especially in cases where there is parasitic tolerance or when the human organism shows partial immunity in a more or less degree.

A case came under my observation which I have no doubt was a spontaneous cure. One of my patients recovered from a serious attack of grippe complicated with pneumonia. He was delirious and had a very high temperature for weeks. When he recovered from these ailments he also was cured of the Spirochetosis riverensis. I believe that the continuous high temperature he had for so long in his period of illness had destroyed the parasites.

SCARCITY OF THE DISEASE IN THE SOUTHERN PART OF RIO NEGRO

This disease is not usually found in Montevideo except in visitors or persons emigrating from the northern part of the country. A fact to be taken into consideration is that the sea air proves beneficial to those affected with the disease. Patients who come to the seashore seem to obtain immediate relief and I attribute this effect to the radioactivity of the sun and sea air.

DIAGNOSIS

To diagnose the disease it is my custom to ask the following questions:

Question 1: Have you headaches or pains in the eyes? Can you stand strong sunlight? Does artificial light, red color, lines, the reflection of the sun's rays on water, glass, etc., trouble your sight? Do your eyeballs pain?

Question 2: Do you hear peculiar noises or a constant ringing in your ears?

Question 3: Have you palpitation of the heart?

I then tell the patient to look at the sky and I ask him, "Do you see any *bichitos* shining and moving?" (*bichitos* means small bugs.) To make the patient understand better what I mean when I ask if they see *bichitos* I show them the pictures of the spirochetes and lymphocytes, designed for the purpose of enabling him to differentiate the organisms.

As a rule the intelligent person answers well and is able to describe both structures. To detect the associated bacterium, described above, requires a special training of the eyes, as it is not possible to expect patients to see it at first, but the adult spirochetes are visible to every sufferer.

These questions are on cardinal symptoms and the answers are always in the affirmative when the disease is present. Other questions that follow are on the general condition of health, ability to sleep, memory, feeling of faintness, and especially on secretory gastric disturbances.

A DISEASE OF DISTINCT CLINICAL ENTITY

The disease I have described has not yet been studied in Montevideo and, as stated before, this is the first mention of it. I do not predict that this description will become classical but I am convinced that further investigation will corroborate my findings. While this is my first mention of the disease and its peculiar symptoms, laying great stress on the fact that the sufferers are able to see the parasitic organism with their own eyes, a phenomenon never before known to medical science, I will say that this article is the product of years of keen observation and thorough study pursued by me in the affected zone.

I believe in imparting this knowledge of the disease because it may lead to important conclusions in regard to syphilis and allied diseases and eventually contribute favorably to the handling of one of the most dreadful calamities of the age.

I feel proud of my American education and degree as I am conscious that this country leads the world in medical science and these facts are what prompted me to come from so far to report my work to you.

However, this paper is especially dedicated to my colleagues and countrymen of Uruguay.

I am sure that some other Uruguayan investigators better prepared and more learned than myself will take up this subject so as to be able to deal with one of the most important health problems of northern Uruguay.

Intraperitoneal Implantation of Cervical Carcinoma

New Technic for the Implantation of Cervical Carcinoma and the Extensions in the Parametria with Radium Emanation in Capillary Tubes by the Intraabdominal Route

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The advantages to be gained by the procedure to be described, of opening the abdomen for the purposes of exploration and an accurate implantation of the cervical mass and broad ligaments from above with radium emanation in capillary glass tubes, are many.

At the present time it is a recognized surgical procedure to expose a neoplastic growth, that the limits of extension might be determined and that this growth with these extensions may be implanted accurately with bare tubes under guidance of the eye and the sense of touch, at the same time avoiding injury to the neighboring vital organs and structures.

Carcinoma of the uterus lends itself admirably to this method of attack, since it is difficult to determine with certainty by vaginal examination, the conditions present in a fairly extensive growth and especially if it has been previously radiated. And again, only a limited implantation can be done throughout the outermost extensions in the broad ligaments and cervical tissues effectively, when implanting by way of the vagina.

Previous to coming to the operating room, the patient is given a high colonic irrigation and a vaginal douche. Ether anesthesia is instituted and the vagina is swabbed with one half strength tincture of iodine. The abdomen is opened with a lower midline incision, the patient is placed in the Trendelenburg position and the intestines are packed back to give a clear view of the pelvic structures. Any pathological condition of prime importance is attended to but no time should be lost on minor complications. At this stage the vessels supplying the uterus are ligated. This phase will be spoken of later.

The index and middle fingers of the left hand are inserted into the vagina below and the right hand

in the pelvis above palpates against these. The operator first determines the degree of fixation of the uterus, then passes to the anterior cervical region to acquaint himself with the amount of infiltration and any involvement of the bladder present. Next the fingers below are carried laterally to the left as far as possible while the right hand above palpates

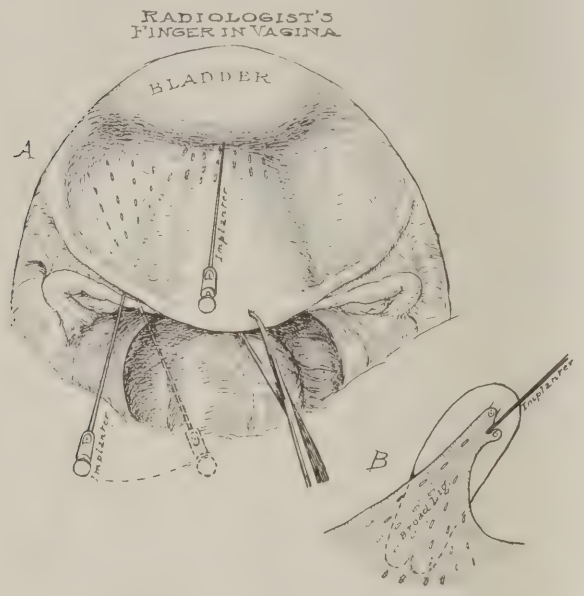

Fig. 1.—A. Implantation of the anterior cervical region and broad ligaments with the radiologist's finger in the vagina. B. Cross section of broad ligament showing the thorough implantation.

the induration of the lateral cervical region and outward extension into the broad ligament. The examination of the right side is made in the same manner. I have found it an advantage to grasp the broad ligament between the fingers and thumb of the right hand to gain further knowledge. At the same time one is able to determine the amount of destruction of cervical tissues caused by the tumor or any previous radiation. Knowing the distance of the bladder from the cervical canal is valuable to the operator since he can judge the quantity of radiation to be applied to this region, thus avoiding a vaginal fistula.

(I do not wish to consider the type of case in this paper in which the extension has passed beyond the broad ligaments.)

The uterus is retracted backward and the implanting needle is inserted in the midline passing downward into the cervix until it is felt to approach the finger in the vagina below. A bare tube is deposited and the needle withdrawn for one half to three quarters of a cm. and another capillary tube is deposited. This procedure is repeated until the requisite number is embedded in the puncture channel. Fig. 2 is a diagrammatic sketch showing a number of puncture channels approximately three quarters cm. apart with bare tubes distributed evenly throughout the involvement of the anterior cervical area. Any further involvement of the bladder wall detected by palpation or transillumination with a strong Cameron light can be implanted with a fair degree of accuracy. A supplementary implantation through the cystoscope can be performed at a later date if the extension penetrates the bladder. Dissection of the bladder from the anterior surface of the cervix gives the radiologist a better approach for the implantation of the roof of the vaginal wall, yet where it becomes necessary to traumatize the cancer tissue, it is better to implant without dissection.

For implanting the lateral cervical section and broad ligaments, especially the anterior parts of these structures, the fingers in the vagina are carried laterally while the implanting needle is inserted in the area lying between the round ligament and the tube passing downward and medially into the cervical tissue. After bare tubes are implanted in this region, the needle is angulated outward while the fingers below are carried more laterally and bare tubes are embedded throughout the extensions in the parametria especially the anterior portion.

In some cases it is necessary to make several puncture channels laterally to facilitate a thorough and even implant of seeds throughout the broad ligament to the pelvic wall. More radiation per unit volume of tissue is given to the neoplastic tissue by the embedding of more bare tubes or using seeds of higher units than is given to the adjacent uninvolved tissues of the parametria. The right side is treated similarly (Fig. 1). So far I have used from ten to eighteen capillary tubes for the implant of each side, varying the number with the degree of involvement.

In the next step, the fingers are removed from the vagina and the index finger is inserted in the rectum, while an assistant retracts the uterus forward. Palpating with the right hand above against the finger below, the operator determines the degree of involvement of the post cervical region. By carrying the examination laterally, the infiltration in the posterior section of the broad ligaments is noted. After bare tubes are implanted in the posterior section of the cervix the implant needle is next inserted in the cul de sac passing downward and forward until felt to approach the finger in the rectum. By the sense of touch and the exercise of care, bare tubes may be implanted within a short range of the rectal wall if necessary without puncture or injury. From three to five puncture channels are ordinarily

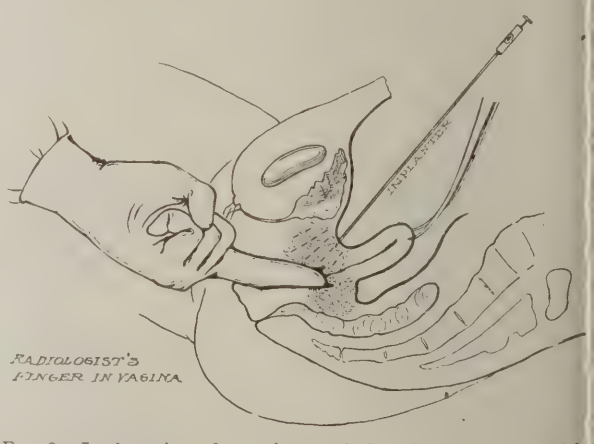

Fig. 2.—Implantation of anterior cervical region with the radiologist's finger in the vagina.

essential for accomplishing this procedure (Fig. 3).

Succeeding this, the finger below is carried laterally and the posterior sections of the broad ligaments of the left side are implanted—something which was not able to be accomplished so successfully while the finger was in the vagina. This technic is applied to

the right side also (Fig. 4). If ligation of the vessels was previously resorted to, the peritoneal openings are not closed until after the implantation is completed. Readier access to the involved area is afforded since the implant needle is inserted through these openings without injury to the ureters and large

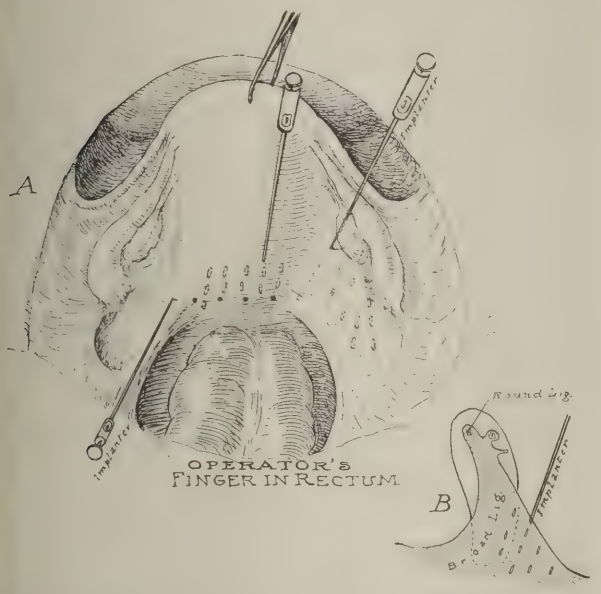

Fig. 4.—A. Implantation of posterior cervical and parametrial tissues. B. Method of implanting posterior section of the parametria.

vessels whose position is clearly defined (exposed).

A cigarette drain should be left in the culdesac extending from the lower angle of the wound if there is fear of infection following. Cancer tissue has been proved to harbor infection in some cases, and the necessary amount of emanation used stimulates the production of a serous exudate. Considering these facts, it would appear that a drainage is warranted. But in a recent case where the drainage was omitted, the patient made a rapid recovery.

Provided the involvement of the parametria is not too extensive, a bilateral catheterization of the ureters will aid the radiologist in avoiding injury to these structures, especially when the vessels are to be ligated. The ureters are somewhat more resistant to radiation than most other structures which permits us to implant bare tubes in close proximity to them without apparent harm.

LIGATION OF UTERINE ARTERIES

Ligation of the uterine blood supply is essential. This ligation may be a combination of any of the arteries which supply the uterus, i. e., the anterior branches of the internal iliacs, the uterine and ovarian arteries. I believe that the ovarian arteries should be ligated in all cases, together with the anterior branches of both iliacs. It is more efficacious in the less extensive cases to follow Dr. T. H. Morgan's technic of substituting the ligation of the uterine for the iliac on the side preferred. These vessels above should be ligated as near to their source as practicable.

As stated above, this not only controls the immediate hemorrhage, affords readier access to the implantation of the involved area, lowers the resistance of the cancer cells to the radiation, but decreases the nourishment to the tumor and acts as a safeguard to future hemorrhages should the radiation produce any necrosis. But the amount of radiation must be decreased if the vessels are ligated.

Suffice it to say, that one should attempt to clear up any pelvic infection before proceeding with the technic outlined above and all care should be used to avoid embedding bare tubes in infected tissues.

Involvements of the vaginal walls are best treated by applying filtered radiation to the surface by the vaginal route.

When the patient's condition permits, it is my opinion that the intraperitoneal implantation with a ligation of the uterine blood supply should be performed primarily. This method is especially advantageous since the operator does not have to face the difficulty of determining whether the induration of the parametria is a carcinomatous infiltrate or one of fibrosis produced by any previous radiation. The furthermost extensions are immediately checked and the hemorrhage is controlled.

METHOD OF APPLYING RADIATION

But when the patient's condition is poor and a laparotomy is too hazardous, the usual method of treatment is resorted to, namely, the insertion of uterine metal tubes in tandem containing radium in such a manner that the cervix receives approximately double the amount of radiation as does the fundus. In addition to this, it will often prove beneficial to implant bare tubes in the cervical mass and parametria laterally to a limited degree through the vagina. By taking this step, the hemorrhage is checked, the cancer cells are rendered less active and the foul smelling cervical mass, if present, is removed. This permits the patient's condition to improve to such an extent that an intraabdominal implantation is made possible later. If, however, there is any destruction of the cervical lips, then the dose must be decreased in proportion to the degree of destruction, because of the danger of inducing a slough.

Several factors, more or less variable, need to be considered according to the case in hand. Some of

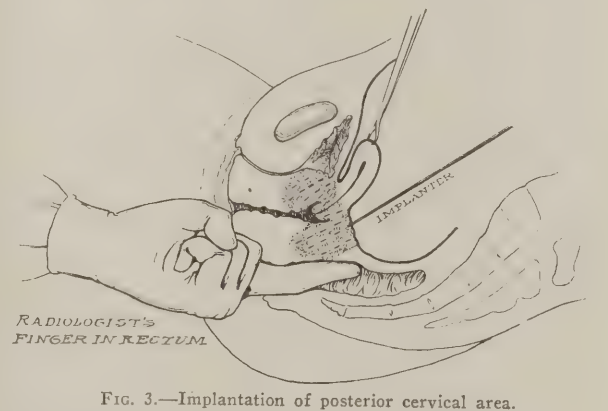

Fig. 3.—Implantation of posterior cervical area.

the leading radiologists at the present time recommend bare tubes of approximately one millicurie for the treatment of neoplasms in other regions of the body. But from recent experience, I believe the best results are obtained when bare tubes of lower units are used in this work, ranging from two tenths

to six tenths millicuries. If capillary tubes of lower concentrations are used, then the operator is permitted to use a greater number which facilitates a more even distribution throughout the neoplasm. While if bare tubes of the higher units are used, the effect is escharotic in nature, and the necrosis which takes place will often be followed by fistula, hemorrhage, infection and severe pain. It has been referred to above that a greater number of bare tubes of higher units are embedded per unit volume of neoplastic tissue than are in the uninvolved adjacent to the growth. If in the former, bare tubes of three tenths millicuries are used, this affords approximately forty-four millicurie hours while for the latter four tenths gives off thirty-three millicurie hours of unfiltered beta radiation (as well as gamma). I have used in the neighborhood of twenty millicuries in sixty or more bare tubes without sequelæ in nonradiated cervical carcinoma and parametria with ligation of the blood supply.

RESULTS OF TREATMENT

The chief object in applying radiation in such doses as mentioned above is to bring about a gradual change in the neoplastic cells so that they are devitalized *in situ*. At the same time the radiation inflammation in the adjacent uninvolved tissues of the parametria stimulates the production of fibrous tissue and blocks the lymphatics which prevents further extensions and metastasis. While I was on the service of Memorial Hospital, Dr. D. Quick stressed the importance of distributing bare tubes in the periphery of the tumor. But from recent experience, I believe better results are obtained not only in following this procedure, but by implanting even beyond the base of the tumor in the adjacent surrounding tissues. This step, in addition to the effects mentioned above, produces changes in the walls of the arterioles and the abundant uterine venous plexus thereby diminishing the supply of nourishment to the tumor. The ultimate effect, then, is a radical complete radiation hysterectomy without an accompanying high rate of mortality.

Schmidtz recognized the incompleteness of controlling cervical neoplasms by the insertion of uterine metal tubes of radium alone, in those growths which had extended beyond the cervical tissue, when he stated, "A limitation to the application of radium is given by the bladder anteriorly and by the rectum posteriorly. The mucosa of each is two cm. to three cm. distant from the cervical canal, the seat of the radium tube in uterine applications."

And elsewhere Schmidtz stated, "As most pelvic cancers have invaded the regional lymph nodes, usually six centimetres distant from the cervical canal, all cancer cells cannot be reached with radium without irreparable injuries to normal tissues."

Recently, in a case of inoperable cancer, Schwartz introduced radium needles into the abdomen through a laparotomy incision.

Proust and Mallet used radium tubes holding about two milligrams of radium element which are protected by a filter.

In a recent conversation with Dr. Benson, he stated that he followed the intraperitoneal method of implanting uterine carcinoma in certain cases.

I am unable to find any description of the method described in literature whereby the radium emanation bare tubes are implanted in the uterine carcinoma and broad ligaments intraperitoneally.

CONCLUSIONS

The abdominal route for the implantation of bare tubes of radium emanation into the cervical carcinoma is not applicable in those cases which: 1. Refuse laparotomy. 2. Are amenable to surgical eradication. 3. Have metastasis and extensions beyond the parametria.

But it is the most preferable method of treatment in the following conditions:

1. In those cases where the extension has passed to the parametria.
2. In the borderland type of cases where the surgeon is doubtful of being able to remove all the neoplastic tissue completely.
3. When the patient will permit a laparotomy for the purpose of implantation but not for radical hysterectomy.
4. In cases where the patients have been previously irradiated by the vaginal route in whom surgery is not practicable but who have recovered sufficiently to undergo a laparotomy.

ADVANTAGES OF TECHNIC DESCRIBED

Some of the advantages offered by the technic described are:

1. It is the only means of application of sufficient radiation to destroy all neoplastic tissue in a very large percentage of cases without severe injury to the bladder and rectum.
2. It is not accompanied by a high rate of mortality.
3. The lymphatics are blocked and many of the venous radicles are closed.
4. The nourishment to the tumor is decreased.
5. Hemorrhages are controlled by the ligation and radiation.
6. Laparotomy is essential for, a, determination of the degree of extension; b, ligation of the uterine blood supply; c, and an accurate distribution of the radium emanation tubes evenly throughout the neoplasm under guidance of the eye and the sense of touch without injury to the bladder and rectum.
7. The cancer cells are devitalized *in situ* without favoring metastasis and extension.
8. The fibrosis produced in the adjacent uninvolved tissues acts as a barrier to an extension where any cells become active at a later date.
9. A supplementary application of radiation may be given by the vaginal route later, if necessary.

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Psychology, Psychopathology and Psychotherapy in Tuberculosis in Civilian and Military Life

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A lengthy paper on this subject was prepared upon the invitation of the editor of *The Military Surgeon.* It was read in part by the author before the annual meeting of the Medical Association of the Greater City of New York at the New York Academy of Medicine on January 19, 1925, and appeared in full in the March number of *The Military Surgeon,* which is the official publication of the Association of Military Surgeons of the United States. Although the journal is widely read by the members of that organization, few physicians in civil life have an opportunity to read it.

The subject matter dealt with in this article, however, is equally important for military and civilian physicians, so I am glad to avail myself of the hospitality of the MEDICAL JOURNAL AND RECORD to reproduce the article in a condensed form, giving what is most essential to both civil and military practice.

I had been prompted to write this paper because of two recent articles, one by Dr. George A. Crofton, entitled The Mental Phase of Tuberculosis, which appeared last June in *The Military Surgeon,* and the other entitled Neuropsychiatry in Tuberculosis, by B. J. Weigel, of the Albuquerque Sanatorium, New Mexico, which appeared in the MEDICAL JOURNAL AND RECORD of January 7, 1925. In these articles the mental status of the tuberculous is pictured in a manner which I consider not based on facts and experience but as most unfair and unjust to the consumptive sufferer.

I quote from Dr. Crofton's article: "In general, the mental reactions of the phthisical patient may be said to indicate a reversion to childishness. Such suppression and modification of original tendencies as may have resulted from environment and education are to a large extent broken down by the disease, and the weakened physical condition of the consumptive affords them an opportunity to appear boldly and unhindered. In other words, the patient has a tendency to react in a primitive, instinctive manner, acting upon impulse, driven by his unbridled emotions, at the mercy of his own undisciplined will."

Dr. Weigel makes the following statement: "The necessary restraint and careful living imposed upon the tuberculous in all stages no doubt tend to bring about a chronic invalid reaction which borders on, if not actually constitutes, a neurosis." He says that among two hundred patients he had studied carefully, ninety-four were suffering from a definite psychoneurosis or psychosis.

These strong statements remind me of a controversy I had, some years ago, over an article which appeared in the *New York Medical Journal,* written by Dr. G. A. De Santos Saxe, and entitled Psychical Relations of Tuberculosis in Fact and Fiction. Quoting another author who had found a number of patients disregarding his orders concerning the care of their expectoration, and observing one who had expressed the wish that his young wife should not survive him, Dr. Saxe made the following statement: "To me this account shows the germination of a homicidal tendency, which is the resultant of the psychical defects that I have outlined in my analysis of the average consumptive's mental peculiarities. Here psychasthenia, the loss of self-control, and the rise of brute selfishness have combined to distort the clearness of ethical perception. . . . The fundamental factors in the psychical makeup of the typical consumptive are the loss of selfcontrol, the rise of brute selfishness, the increase of susceptibility to suggestion, to emotion and to nervous irritation, and the tendency to rapid nervous and psychical fatigue."

In a recent otherwise very excellent textbook on tuberculosis by Dr. Fishberg, we read a similar statement: "A psychic trait of the consumptive which has been noted by most writers is selfishness. He becomes egotistical and egocentric, he is interested in the welfare of but one person—himself—to the exclusion of all who have depended on him before. He will eat costly food while his children starve; he will make unreasonable demands on his relatives and friends and show no gratitude. As Saxe states, the ascendency of selfishness plays the most important rôle in the molding of the mental traits of the tuberculous."

I protested against these accusations at the time and collected the opinions of some of our leading men to back me up in my plea for fair play and justice to the consumptive. For this occasion I will quote only a few of these opinions. Hermann M. Biggs wrote: "I do not believe that there is any greater evidence of selfishness, loss of selfcontrol, or distortion of ethical perception in the consumptive than in other persons." Edward G. Janeway said: "It is my experience that the average consumptive is not inclined to brute selfishness, loss of selfcontrol, and hence distortion of the clearness of ethical perception. I have found so much to the contrary that I am surprised at so broad a charge against the consumptive invalid." Our unforgettable Sir William Osler wrote: "My impression is that the unfortunate victims of tuberculosis are above the average in their mental and moral character; secondly, I should say emphatically that the average consumptive is neither inclined to brute selfishness nor any special distortion of the ethical perceptions. Such statements as made in the *New York Medical Journal* are an unwarranted slander."

Two eminent experts versed in our most modern conception of psychopathology, when asked to express an opinion on the supposed mental abnormalities of the average consumptive, had this to say: Carlos F. MacDonald: "A large experience in the care of insane consumptives, together with the observation of at least several hundred cases of tuberculosis who were not insane, makes me agree abso-

lutely with your own views as to the moral qualities of the average consumptive. My noninsane patients, almost without exception, exhibit the cheerful, hopeful mental attitude that is common in tuberculosis."

Gregory Stragnell, editor of the Medical Journal and Record: "From my experience, the psyche of the patient with a tuberculous lesion is no different than that of a socalled normal person. Among them we find psychoneurotics and psychotics but we cannot generalize as to the psyche of a large number of persons afflicted with an organic condition, such as tuberculosis. Undoubtedly the psychological factors play an important rôle in the picture as a whole. It would be well worth while to conduct an extensive study to ascertain the interrelationship between the psychological factors and the organic condition. This would apply of course to every organic situation. This would be of service in both the prophylactic and the therapeutic fields. Specialists in tuberculosis are cognizant of this fact, quite unconsciously no doubt. This is shown by the attempt to place the tuberculous patient in as cheerful and wholesome environment as possible. The psychological background should be considered as important as the other components of diet and fresh air. There is much to be done in working out the finer details of these interrelationships, and Dr. O'Malley, of Washington, D. C., and Dr. Smith Ely Jelliffe, of New York, have gone into this matter, and it would be well to give an impetus to the work they have begun."

Of my own experience, gathered from a thirty years' exclusive practice among the tuberculous in all kinds of environments and in all stages of the disease, I may say that among the dearest recollections of my life I will always count the gratitude of many consumptive patients, expressed either at the assurance of their recovery or for the care bestowed upon them when their case was beyond human help. I could mention many instances where a well to do tuberculous sufferer provided munificently in his will for the care of the consumptive poor. Does this indicate a reversion to childishness or an undisciplined will, a psychosis, or a psychoneurosis?

What shall I say of the many physicians who engaged in tuberculosis practice because they had had the disease themselves and became eminent in their chosen specialty? The first one that comes to my mind is of course that saintly figure, Edward Livingston Trudeau. You all know his life. Now listen to the reply he sent me when I asked his opinion on Saxe's statement: "I have seen certainly more patience, courage, selfdenial and unselfish devotion to others in consumptives than I have noticed in the majority of healthy human beings. Indeed, the sanatorium work never could have been carried on were it not for the selfsacrificing devotion to the suffering of others shown by my associates, the nurses, and even the employees at the sanatorium, most of them having come here originally because suffering from tuberculous disease. History is full of instances which prove that tuberculosis does not interfere with the development of the highest degree of the intellectual, the moral and the ethical sides of man's nature."

My two European teachers, Professor Grancher of Paris and Geheimrat Dettweiler of Falkenstein, were both tuberculous; they not only accomplished great things, but they could also enthuse their pupils by their own keenness, their analytical minds, and their strength of character. As an example of the latter quality, I must mention my English friend, Sir St. Clair Thomson, who, with his high intelligence, great force of mind and strong character, succeeded in curing himself of a serious laryngeal tuberculosis with pulmonary involvement by imposing upon himself one year of absolute silence.

There are many among the leaders and officers of the American National Tuberculosis Association and among the physicians in tuberculosis sanatoria and health resorts who have been, or are still, actively afflicted with tuberculosis and who nevertheless have done or are doing splendid work, and in whose daily beneficent labors not the slightest trace of a mental peculiarity could be discovered. There are too many to mention them all, but a few of them may be cited.

Colonel George E. Bushnell, of the United States Army, who passed away only recently, was the head of the antituberculosis work during the World War and did yeoman service in this capacity. Herbert M. King, the genial medical director of the Loomis Sanatorium, left a splendid heritage of ideal sanatorium work. McDugal McLean left as his last gift to his fellow sufferers that wonderful and inspiring little volume *Tuberculosis, A Primer and Philosophy for Patients and Public*. Among those still in the midst of an active life are Edward R. Baldwin, dean of the Trudeau School; Lawrason Brown, his equally eminent associate; David R. Lyman, Charles L. Minor, and Gerald B. Webb, all acknowledged as great authorities in tuberculosis and expresidents of the National Tuberculosis Association. Our most distinguished American writer on nearly all phases of pulmonary tuberculosis, Allen K. Krause, the editor of the *American Review of Tuberculosis*, is another glorious example of what a tuberculous invalid may accomplish.

Edward S. McSweeny who, from personal experience as director for many years of the Municipal Sanatorium at Otisville and later as superintendent of the Sea View Hospital on Staten Island, can certainly speak with authority on the subject, expresses himself as follows:

"Most of the observations on which have been built the theory of the psychology of the tuberculous date back to the opinions of people who did not have the opportunity to study large groups for a long time, and, like many other observations of like character, can be relegated to the interesting domain of medical curiosity. Tuberculosis is not the cause of the objectionable characteristics which distinguish some of its victims, as has been wrongly and superficially thought and said by those who have failed to recognize that it, like disease in general, especially chronic diseases, was a powerful mordant to bring to light the individual's true character. Despite the belief which has found lodgment in many minds, my conviction from years of dealing with consumptives is that they are a long suffering, patient, normal group."

In thus defending the tuberculous sufferers at large against the stigma of being afflicted with any psychoneurosis or psychosis, I would of course not wish to deny that there may not be among a number of tuberculous invalids some who have inherited or acquired a peculiar nervous or psychological condi-

tion which deserves to be called pathological. They are the exception, however, and not the rule and such conditions may be found in chronic invalidism of any kind.

Prior to a definite diagnosis, the tuberculous patient sometimes likes to lull himself into the belief that there is nothing serious the matter with him in spite of distinct symptoms, and he is afraid to seek medical counsel for fear of a definite diagnosis. If a diagnosis is made on physical signs only, he may still be doubtful because the bacilli are not yet found. Since the x rays show old healed lesions as well as the active ones, he will probably comfort himself with the thought that his lesion is not active and that he had heard of many people going about with latent lesions and being considered healthy individuals. This desire to postpone the knowledge of a definite diagnosis must be dealt with in a most tactful manner. As a result of the definite diagnosis the patient may become hopeful, despondent or indifferent; it will depend on his temperament, his social and financial condition. The situation may be complicated by prospective marriage, and in the woman by the desire for motherhood. Here the tuberculosis specialist must become the skilled psychoanalyst. In terminal cases, when the tuberculin, constantly created, produces a veritable anesthesia, the patient often becomes optimistic and sure of his recovery. It goes without saying that to undeceive him in this happy state of mind would be useless, unwise and even cruel. What must be guarded against in such a condition is for the patient to attempt to make any extraordinary physical effort which he was unable to do a little while before. If this is not impressed upon him, some overexertion may hasten a fatal issue by a heart strain or severe hemorrhage. Nevertheless, this state should be utilized to urge the patient to put his house in order and he may be reminded that no one has ever died from making his will.

To prevent the possible development of a psychosis or psychoneurosis in a tuberculous patient, the physician should receive him in a cheerful, well ventilated room, scrupulously clean, and with fresh reading matter on the table. If at all possible, tuberculous patients should be received by special appointment. A reception room full of coughing patients, some not over careful when coughing, spraying the air with infectious droplets, may be enough to lay the foundation for a psychosis. In the anamnesis not too much stress should be laid on family history, but emphasis should be laid on the fact that the loss of one near relative by tuberculosis does not mean that the rest of the family is doomed. The patient should be told that if a hemoptysis has occurred or will occur, it is one of the phases of the disease which by no means lessens the chances of recovery. Concerning the sputum, he should be assured that if he takes care of it there is not the slightest danger of his giving the disease to anybody else, and his relatives and friends who may be with him should be warned against developing phthisiophobia. Nothing will make the tuberculous patient more miserable and despondent than to be treated like a leper.

The prognosis should always be guarded but expressed in hopeful terms, and no fixed time for recovery should be set. The patient should be impressed with the fact that the more carefully he carries out his instructions the sooner he may look for the arrest of the disease.

The patient should be asked directly if he has any mental anxiety, and if it is within the power of the physician to remove it, he should endeavor to do so. If he worries on account of financial matters, the relatives should be informed of it so that steps for relief may be taken. The patient who worries will not eat well, and his recovery will be inevitably retarded thereby. Worry and anxiety are among the greatest obstacles to the successful treatment of tuberculosis, particularly among the poor, when the patient is the breadwinner of the family. Doomed to temporary inactivity, as otherwise he cannot be restored to health, he usually broods over his fate and worries about how those who are dependent upon him will get along. As already suggested, wherever the relatives are in a position to relieve the patient of financial worry, they should strive to do so, but when the relatives themselves are poor, of course no relief can be expected from them. The wonderful results obtained by Dr. Pratt, of Boston, were doubtless due to the fact that with the aid of funds placed at his disposal by the Emmanuel Church he was enabled not only to take the very best of care of a large number of his tuberculous poor by installing the sanatorium treatment in their own homes, but he could investigate the financial resources of all the patients under his care, and when there was want, the good men and women of the church supplied food, clothing, and other necessities of life for the family so that the patient could feel absolutely sure that those who were dependent upon him were amply provided for. To appreciate this phase of psychology in the treatment of the consumptive, one must have observed the psychological change in a patient who was suddenly relieved from anxiety concerning his loved ones by the assurance that all was well at home and that there was no suffering or want. It is not to be wondered at that the results obtained by Dr. Pratt equalled, and in some instances surpassed, the best results obtained in sanatoria for the consumptive poor located in almost ideal climatic regions. Here is a field where public and private philanthropy can do immeasurable good.

Good but not exciting books and quiet and hopeful conversation will help to pass the time pleasantly and lead the invalid's thoughts away from his disease. The controlled diaphragmatic breathing, which may also be called rest breathing, aside of its beneficial physical effects, has proved to be of great value in diverting the patient's mind from his troubles, as it requires concentration. It is a good idea to tell him that whenever he feels depression coming over him he should immediately resort to this therapeutic measure, and he should be impressed with the thought that every time he saves his lungs an unnecessary movement he produces local rest for an inflamed organ which hastens his cure, and also quiets his usually rapid heart action.[1]

In institutions the patients should be forbidden to relate their trouble one to another or give advice to do this or that. The patient should receive only such visitors as he desires to see and they should be

[1]To any physician interested in this method of controlled diaphragmatic breathing Dr. Knopf will be very glad to send a reprint explaining in full the modus operandi of this method and giving the reports and opinions of leading authorities on the subject.

asked to talk as little as possible of the patient's ailment. Persons inclined to melancholy, or those who are apt to irritate the patient, should be asked to shorten their visits and appear as seldom as possible.

The desire to try quack remedies is sometimes not confined to the ignorant alone. The pamphlets issued by the American Medical Association and the National Tuberculosis Association on *Quacks and Quackeries* are often good literature to hand out. If the patient desires a climatic change, having heard that in this or that climate someone was cured, it may often be just as well to let him have his way. Insomnia, due to pure overactivity of mind or to too much introspection, is nothing unusual in the tuberculous, and since opiates and bromides should be avoided as far as possible, the method of diaphragmatic respiration will prove an excellent means to produce the complete relaxation of mind and body most conducive to sleep. With a little practice he will soon learn to control his cough, and only cough when he has to expectorate.

In the actively tuberculous invalid one quite often finds a disinclination to taking food, or a sufficient amount of food. This type of anorexia is rarely based on evident gastric or intestinal disturbances but may be considered exclusively nervous or psychic. Such patients must be taught that their capacity for digesting and assimilating is far greater than their appetite may indicate, and if they can overcome their disinclination and eat regularly and sufficiently, they will improve rapidly.

Some patients will bear pain patiently, others will magnify it. The physician should listen sympathetically to complaints even if inwardly convinced that the trouble is imaginary or greatly exaggerated in the patient's recital. Nothing is gained by disputing the patient's claim that he suffers, but he may be told that the trouble is probably of nervous origin and will pass away as soon as he is quiet. If the patient is actually suffering he should, of course, be given relief by medicinal agents. If his mind is depressed and it can be diverted to other things by rest breathing, autosuggestion, work, or prayer, the medical attendant will of course resort to these means. If the patient is of a religious nature, the cooperation of the minister of his church is often most helpful to overcome despondency and restore a hopeful outlook to the discouraged sufferer.

It may often be of great advantage to the tuberculosis specialist to familiarize himself with our newer conception of neuropsychiatry so as to be able to suggest wisely, persuade, and reeducate. Besides this, there are some qualities of mind and character which the tuberculosis physician must cultivate in order to meet all the psychological conditions which may arise in the tuberculous invalid. There is needed first of all, an unbounded enthusiasm for his work and a firm belief in the preventability and curability of tuberculosis. He will need a never failing cheerfulness and kindliness, patience and gentleness, and an absolute firmness when firmness is necessary. Imbued with his divine mission as a healer of an infirm body, which is often the cloak of a sick and weary soul, he will rarely fail to give the tuberculous patient the hope and cheer which is so essential to recovery and comfort and peace where human aid cannot avail.

Occupation therapy, now so extensively applied for rehabilitation of our war veterans, and also in some civilian tuberculosis institutions, is of inestimable value in psychotherapy. When the occupation can be made remunerative, it is so much the better. Of course, the patient must not be allowed to overwork in order to earn more. The new factory recently established here by the New York Jewish Tuberculosis Committee, where the patient's earnings are supplemented by a fund so that the tuberculous invalid can feel that with his earnings added, he is again supporting his family, is an institution well worth emulating. It means raising the morale and selfrespect of the patient and prevents mental depression.

All that has been said thus far of the tuberculous invalid in civil life is also applicable to the tuberculous soldier and exsoldier, yet the physician who has to deal with the latter class must admit that a peculiar psychology may be at times observed in military life. The physicians who have had occasion to serve on draft boards as well as the officers in active service whose task it is to examine volunteers for admission in the army, will know that the man who is eager to enter military service will hide any possible infirmity, and when asked the usual questions pertinent to the anamnesis of tuberculosis, he will flatly deny ever having coughed or spit blood, having had a real hemorrhage, fever, or continued loss of weight, or experienced any feeling of tiredness, etc., and no family history of tuberculosis will be admitted. On the other hand, physicians on draft boards will recall instances where an individual in apparently good health but eager to escape military duty, gave a perfect tuberculosis family history and recounted on examination all the symptoms of tuberculosis. He would give a clinical picture of a typical tuberculous patient with accuracy and his answers would resemble those of a third or fourth year medical student. A careful physical, x ray, and sputum examination and a few days' observation will of course clear up such cases.

Tuberculous exsoldiers are sometimes difficult to handle, because, being no longer under military orders, they do not like the new discipline. A heart to heart talk by the ward surgeon usually suffices to convince the invalid that without discipline he can not get well. The nostalgia, which becomes very pronounced with some of the exsoldiers when they have been away from their homes and families for a long time, is apt to increase with the enforced bodily inactivity and sojourn in the hospital. This, the present administration of the United States Veterans Bureau, under the leadership of General Hines, is trying to overcome. A number of War Veterans Hospitals for tuberculosis have been established in various states from the Atlantic to the Pacific so that the tuberculous exsoldier may be in an environment as near as possible to his former home.

Occasionally, there is one regrettable phase met with that is distinct and unique in the tuberculous exsoldier. Our generous government has provided him with a handsome pension besides his being housed, well fed, and well taken care of in general, in our fine new war veterans hospitals or in a pleasant boarding house in some health resort. He rather enjoys the inactive life and has no desire for the change which would come about by an arrest or cure

of his disease, cutting off his pension and forcing him to leave the hospital. Such patients will do everything possible to prolong their stay, even going so far as to procure or purchase tuberculous sputum to make the examiners believe that they are still in the active stage of the disease. Such a patient must be treated with firmness and convinced that he will enjoy life more as a recovered selfsupporting citizen than to remain a chronic invalid.

It was my privilege to serve for nearly two years as physician to tuberculous veterans of the recent war, and while I must admit that there were occasionally among my patients some of the types just described which were hard to discipline, some inclined to alcoholism and even drug addiction, because the unscrupulous drug and alcohol venders found the hospital comparatively easy of access, as a whole I look back upon my service at the United States Veterans Bureau Hospital No. 61, at Fox Hills, Staten Island, with the most pleasant recollection and with the firm conviction that even among the war veterans it cannot be said that there is any distinct psychosis or mental phase due to pulmonary tuberculosis alone.

In the many years of my labor among the tuberculous I have never seen more courage, more patience, more helpfulness and genuine sympathy for each other, and at the same time more cheerfulness, than among the tuberculous exservice men and women at the United States War Veterans Hospital No. 61. On the battlefields of Flanders and France, on land and on sea, when they were facing death or shot and shell, they sang "Smile, smile, smile," and they are still smiling today.

In conclusion, I desire to protest with all the vehemence possible, against the accusation that the million tuberculous still in the midst of our civil population have reverted to childishness, are driven by unbridled emotions, are egotistical, egocentric, and ungrateful, and that nearly fifty per cent. of them are definitely suffering from psychoneurosis or psychosis. With equal ardor would I defend against these characteristics the more than ten thousand American soldiers who returned to us tuberculous from the World War, and those who were not able to return because too severely wounded by the deadly bacillus and who finally made the supreme sacrifice.

16 West Ninety-fifth Street.

Simplified Device for Chest Aspiration

MILTON A. BRIDGES, M.D.

New York

This little apparatus for chest aspiration is readily portable and inexpensive. It has been successfully used for the past three years in both private and hospital practice. In comparison with some of the aspirators now in use, it offers a minimum chance for air leakage and production of artificial pneumothorax. With it asepsis is easily maintained and clogging of the aspirating needle or valve can be overcome without difficulty. The parts of the instrument require very little care and will not deteriorate.

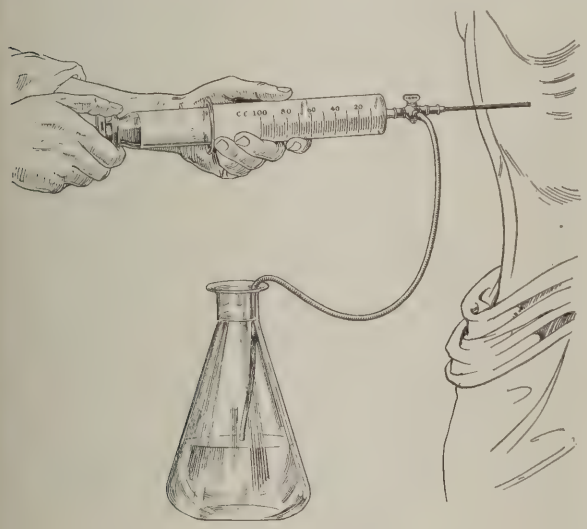

Fig. 1.—Syringe

The following illustration and directions speak for themselves:

Parts.—One hundred c. c. Luer syringe. Rubber tubing three eighths inches diameter, twelve inches in length. Three assorted gauge needles adapted for Luer nozzle. One special B-D Luer fitting stopcock.

Directions.—Stopcock is interposed between the needle and the syringe. The rubber tubing is connected with the side outlet of the stopcock. The turn key is set pointing toward patient. After cocainization of the parts, the needle, attached as above, is inserted between the ribs. Withdrawal of the plunger draws fluid from the pleural cavity. The average hundred c. c. syringe will readily hold 130 c. c. with each withdrawal of the plunger.

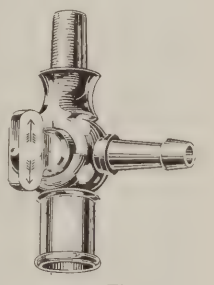

Fig. 2.—Three way stopcock.

After the syringe is filled, the three way stopcock is turned, the plunger pushed in and the fluid emptied through the rubber tubing into a waiting container. This process is repeated until the desired amount of fluid is removed.

In the event of plugging by fibrin, pus, or other material, withdrawal of a few c. c. of sterile water or saline from a container back through the rubber tube into the syringe and subsequent clearing of the needle will readily remove any such material from the apparatus.

148 West Seventy-fourth Street.

The Diagnosis of Acute Conditions of the Brain

J. VICTOR HABERMAN, M.D.,
New York

(*Concluded from page 542*)

SYPHILIS

When we approach the subject of syphilis we open up a mercilessly difficult chapter. One must keep in mind a bird's eye view of the neuropathological possibilities. Syphilis may be latent (XXXVI) or active. Where active, whether acquired or congenital, one may get a meningitis or encephalitis—most usually a meningoencephalitis, gummatous massing, in circumscribed areas (tumorlike) or diffusely spread out (especially basal). The vessels in the affected parts become implicated, and there may be breaking of same and softening of areas. One may furthermore get cerebral endarteritis (Heubner), with occlusions, aneurysms or miliary aneurysms and hemorrhages, a serous meningitis, paresis. These conditions are chronic. The patient may have outspoken symptoms of these various forms, or only mild manifestations —so mild as not to be noticed, or nothing but residual stigmata of earlier outbreaks, or, as is often enough the case in congenital syphilis, no manifestations at all (96). But any of these forms may show acute exacerbations. Thus, in a person who knows he has syphilis, or in one who doesn't suspect it, "out of a clear sky," so to speak, brain symptoms may appear: headache, dizziness, convulsions, coma, hemiplegia or monoplegia, aphasia, cranial nerve paralyses, hemianopsia, blindness. Usually there is no temperature, yet occasionally there may be. In the arterial form, one will have disturbance in circulation and nutrition and productive inflammation of tissue, with secondary sclerosis, and so, often, mental or character changes.

An acute syphilitic meningitis, though unusual, also occurs, clinically serious and often almost identical with the picture of tuberculous meningitis. This is likewise true of the occasionally acute gummatous form. There are the same prodromata in both, acute hemiplegia or paraplegia, convulsions, delirium. In both cases, also, there may be a lymphocytosis and a positive Phase I [Nonne]. Syphilitic meningitis serosa may also suddenly flare up and become serious. Perhaps a syphilotoxic encephalitis may also occur on the basis of lues—as Oppenheim surmised. This author deemed a nongummatous simple meningitis possible though this was doubted by Virchow and Heubner.

With the exception of paresis, the symptoms occasioned by these various pathological conditions are in no wise characteristic. The diagnosis cannot be made on them alone. Ever so often, the clinical picture is complicated (XXXVII), even bizarre.

In the endarteritic form, one must consider the possibility of the sudden breaking of a vessel (apoplexy), which, strange to say, remembering the fragility of luetic vessels, is a very unusual occurrence, especially in children, but also in adults (cf. Nonne, No. 15, p. 553). Still, it does happen. Or, one may get a thrombosis, with softening. Again, vessels collapsing (secondarily) in the softened area may lead to hemorrhage. The general symptoms may here be mild. But a hemiplegia results—which either again clears up or persists. In König's statistics seven per cent. of the cases of cerebral paralysis in children belong to this group.

An acute diffuse pontine and bulbar syphilitic affection likewise occurs. In these cases, there may be a rise in temperature, just as this may be lacking in encephalitis and bulbar myelitis. In a majority of the reported cases, the patients were children or young individuals. It should be remembered that syphilitic pontine disease is frequently associated with basal meningitis—or other cranial or cerebrospinal manifestations, which will aid in the diagnosis.

Nor must we forget that a person who once had syphilis—and still has it, or has been cured—may acquire any of the forms of nonsyphilitic encephalitis or meningitis. Should such a patient give a positive Wassermann, it need not mean that the presenting disease is syphilitic.

Keeping these general facts in mind, how make our diagnosis? It is a safe plan to believe everyone syphilitic until the contrary is proven. This admonition should be taken to heart—a lesson one may be taught too late by the blunder of deeming certain persons exempt or inviolate, "who could not by any chance have been exposed" or "where this can scarcely come into question—no outspoken symptoms, big family, with many children and grandchildren, etc., etc." Take nothing for granted—first rule out syphilis in every case.

In taking the history (XXXVIII), inquire as to possible exposure, appearance of primary, secondaries, later symptoms (alopecia, leucoderma, pareses or paralyses, defective hearing, irreactive pupils, corneal opacities, pigmented retinæ, arterial disease, mental changes, etc.) as to pregnancies and offspring: sterility, miscarriages, stillbirths or deaths in early infancy, especially deaths in convulsions, difficult labor, deformities of offspring or snuffles, pemphigus, tuberculosis or marasmus in same. Where congenital lues is suspected, or in sifting data to this end, we make the above inquiries as to the parents (or grandparents) and look the patient over for retarded growth (height), infantilism, retarded or deficient mentality, character abnormalities (behavior) hydrocephalus, rhagades, excoriations, etc., tears and abnormalities of soles and palms, saddle nose, cubital glands, opacities of cornea (earlier corneal ulcer) notched teeth, defective hearing, irreactive pupils, enlarged liver and spleen, osteochondritis, saber legs, joint trouble (especially the knees—hydrops), Olymphus forehead, abnormal genitals, abnormal nails, possibly scaphoid scapula, spastic paralyses (XXXIX). Hysteria, migraine, chorea, epilepsy may also indirectly point to the disease. Especially important is it to inquire whether any of the patient's fraternity has, or has had, any of these symptoms, or whether any died early in convulsions, or of meningitis or tuberculosis. The parents should also be examined and the blood Wassermann taken.

LABORATORY TESTS

Finally, we come to the laboratory tests proper (XL). The socalled four reactions of Nonne, the Wassermann of the blood, the Wassermann of the spinal fluid, the cell content of the spinal fluid and Nonne's Phase I, have become classical, as it were, and merit the first attention; but other tests, some of recent report, may prove of additional, or even decided, importance, i. e., Pandy, Mastix (XLI), colloidal gold, Sachs-Georgi-Meinicke-3, Dold, etc.

The following clinical classification may help us in arranging our data, though often enough it is first through aid of the laboratory findings that we can properly rubric our case: I, Latent leutic, meningeal, processes; II, cerebral or cerebrospinal (or neurological) syphilis; III, syphilitic endarteritis obliterans of Huebner; IV, paresis or taboparesis; V, tabes; VI, hereditary syphilis (XLII).

By latent lues several things may be meant. Usually two or three weeks after infection, the initial lesion appears. There is a focal accumulation of spirochetes at this lesion point—but some have also got into the circulation, and have been scattered here and there in the body—while the body also by this time may have begun to react (XLIII) (biologically) to irritation of invader and his endotoxin products. The evidence of this reaction is seen in the presence of reagins determined by the Wassermann reaction. In many cases the blood Wassermann is already positive at the time the primary appears—in others, it is not yet positive. In these latter cases, we speak of the seronegative stage. As yet, there are no outspoken symptoms; as yet, the disease is latent. But other organs may at this time, or soon after, show reaction to the invading spirochete: the ear does—it may show reaction, even in the as yet seronegative stage—and also the meninges. The spirochete in the meninges starts a chronic process which has a mild acute flareup in the beginning, noticeable or not noticeable, this then usually simmering down to a symptomless state, or there may merely be headaches, first at some later time becoming manifest. We say the disease is latent during this antesymptomatic period—though we know, through our laboratory tests, through our provocative tests, through autopsy findings, that during this stage something is, nevertheless, going on. This latent period may continue for years—many years, in fact—without signs or symptoms referable to any organ. Here the blood Wassermann may, nevertheless, be positive. Some such patients have even never been treated. There are cases of late latency, with no symptoms save the positive blood Wassermann. But there are cases of latency with negative Wassermann.

Schematically, we may arrange our findings in this *latent stage* as follows:

I.

Blood Wassermann:
with 0.2 cm. (in fresh meningitis forms and meningorecidives), positive.
Spinal Wassermann:
in most cases, negative in fresh infections.
in most cases, positive (more or less) (up to 0.2 cm.) in older stages.
Cell count: between borderline and 1000.
Phase one: may or may not be positive—depending on duration and extent of meningeal process.
The colloidal gold test gives a characteristic lues curve.

Should treatment be instituted with mercury or, especially, salvarsan, one frequently gets a Herxheimer reaction, i. e., a passing hyperemic edematous flareup in the syphilis infected meninges, just as such reaction occurs in the skin and other organs harboring luetic processes, causing increase of cells, albumin and liquor Wassermann values, which not only applies to the latent, but also to the patent period. In skin lesions this often shows up several hours after the treatment; in the meninges, it may reach its intensest stage with the third to the seventh, or even eighth, salvarsan injection. According to Gennerich, such reaction is met with in all cases of primary and fresh secondary type. But in secondary cases which have had much treatment, it may be missed. In tertiary lues the reaction appears still less, or not at all.

In cerebrospinal lues our data may be tabulated thus:

II.

Pressure has little diagnostic value (Nonne).
Blood Wassermann positive in seventy to eighty per cent. of cases (xliv).
Spinal Wassermann with 0.2 cm., positive in twenty per cent. of cases. With 0.3 to 1.0, nearly always positive (xlv) (Nonne).
Cell count pleocytosis plus. This is especially strong in meningitis cases (xlvi).
Phase one plus—but not as strong as in IV and V. Only exceptionally negative (xlvii).
Mastix and colloidal reactions are characteristic of lues cerebri or meningitis curve (or combination).

With sufficient treatment these values recede—or, if cure is obtained, turn negative. Or, again, the process may now become chronic. The blood and spinal Wassermann and Phase I remain the same, the cell count about ten to fifteen.

In syphilitic neurasthenia the blood Wassermann is ninety to one hundred per cent. positive (Citron), Phase I, negative, the spinal Wassermann, in seventy per cent., positive.

Syphilitic endarteritis obliterans may come on even as early as several months after the infection. Prodromata of headache, vertigo, insomnia, loss of memory and irritability may be noticed. Gradually one may observe ethical and character changes come on—occasionally a twilightlike state. Pareses or paralyses, due to narrowing or closing or breaking of capillaries or small vessels, occur. Aphasia, epilepsy, mental defect, may set in. On tearing of the pia, a meningitis serosa, with infiltration into the brain substance, can occur, and give psychic changes. (cf. furthermore the syndrome of occlusion of the inferior posterior cerebellar artery.)

The spinal fluid findings are as follows:

III.

One may or may not find a positive Wassermann.
The cell count may be negative, though a slight pleocytosis is rarely absent (Gennerich).
Phase one may be slightly positive or absent.
Pandy is weak plus, opalescent or negative.
All reactions, however, may be absent. According to Kafka, the blood Wassermann is often positive with only 0.5 cm. The liquor Wassermann is negative with 0.5, but with 1.0 is negative or positive.

In paresis or taboparesis our data read:

IV.

Blood Wassermann positive, almost one hundred per cent. A few cases negative (xlviii).

Spinal Wassermann positive and strong in about ninety per cent., if 0.2 c. c. used. Positive and strong in about one hundred per cent. if larger quantity used.
Cell count marked pleocytosis in about ninety-five per cent. (xlix). In a small percentage it is absent.
Phase one usually positive (usually strong). In a very small percentage it may be absent (l).
Mastix and colloidal gold: paresis curve (K).

In tabes the facts are as follows:

V.

Blood Wassermann positive in about seventy per cent.—may be negative in thirty to forty per cent. (Nonne).
Spinal Wassermann positive in about one hundred per cent. if large quantities of liquor, one c. c., used. Negative in about eighty per cent., positive in twenty per cent., if 0.2 c. c. are used (li).
Cell count positive, usually strong, in ninety to ninety-five per cent. of cases (lii).
Phase one positive, usually strong, in ninety-five per cent. (liii).
Mastix and colloidal gold not always characteristic, often of lues cerebri (Kafka).

In cases of epilepsy, neurasthenia, alcoholic pseudotabes, in which syphilis is absent, lymphocytosis and Phase I are negative (99).

The laboratory tests in hereditary syphilis are not as helpful as one might expect—nor are the reports as uniform.

Nonne notes the following:

VI.

Eight cases of juvenile paresis:
Blood Wassermann, strong plus.
Liquor Wassermann, strong plus; globulin plus.
In one case, negative globulin, in spite of strong lymphocytosis.
Six cases of lues cerebrospinalis:
Blood Wassermann strong plus.
Four cases liquor Wassermann, positive.
Three cases globulin plus.
One case globulin minus.
Three cases of epilepsy on basis of congenital lues:
Blood Wassermann, plus; liquor Wassermann, minus; globulin minus.
Three cases of isolated cranial nerve paralysis:
1. Optic atrophy: Blood Wassermann minus and liquor minus.
1. Central deafness: liquor, minus.

Thus Nonne says the liquor may be free (show a negative Wassermann and globulin test) in many cases of congenital lues

Kafka found that the liquor Wassermann in hereditary lues is almost always negative, save in outspoken hereditary luetic diseases like juvenile paresis and lues cerebri, while the blood Wassermann only in the younger years was positive with 0.2 c. c., somewhat longer with 0.5.

J. Breuer's study (100) of the congenitally luetic children of the Berlin Orphan Asylum, forty-two in number, is extremely interesting. Of the infants examined, the following was found: no increased pressure, no albumin, no increase in cells, negative mastix, no liquor Wassermann.

In older children who had been treated, and in whom the blood Wassermann was negative (several tests), and no symptoms obtained, and nerve lues was present (disturbance of pupillary reflex) in but 9.5 per cent. the liquor showed the following: Increased pressure in 68.3 per cent., spinal Wassermann always negative, pleocytosis positive in 42.8 per cent., Phase one positive in seventeen per cent., Pandy positive in thirty per cent., mastix positive in 68.3 per cent.

Thus, in cases in which both blood and liquor give a negative Wassermann, the liquor, nevertheless, evidences pathological findings, especially heightened pressure, pleocytosis and positive Mastix—and this in children having had the best and most thorough treatment. Finally, it may also be remembered that there are cases of congenital lues in which the individual may show neither signs nor symptoms, need not as yet ever to have been ill, yet whose spinal fluid gives evidence of the disease. Thus, Assmann (101) cites a case of a boy of syphilitic mother who was never ill, though of late complained of some headache and showed some inequality of pupils, whose spinal fluid gave a negative Wassermann, was turbid, contained 700 cells, Phase one, plus; albumin, 5. His blood was positive.

Simplifications of the complicated Wassermann reaction, or simpler yet reliable substitute tests, have been brought out in recent years. Of these, the Sachs-Georgi (cf. No. 42, p. 786), Meinicke (102) and Dold modifications have proved very valuable, and not only as tests for syphilis, but tests to be used in gauging the Wassermann reaction when this proved doubtful, or, again, as corroboration of the test, whether plus or minus. Zieler (103) found the Meinicke precipitation test even sharper than the Wassermann reaction. Jänecke (104) also comes to this conclusion after examining a thousand sera with both Wassermann and Meinicke. In 961, the results were similar. In thirty-nine, or four per cent., differences occurred. Of these thirty-nine, twenty-seven were positive with Meinicke, twelve negative. Thus, here, too, the Meinicke proved the sharper test. In these latter cases the histories gave a syphilitic infection, or the primary affect was present, the Wassermann being as yet negative. Some twenty cases of other diseases, in which syphilis was fairly positively ruled out, were also tested with the Meinicke, and proved negative. Richter (105) examined as many as 2,500 cases with both Wassermann and Meinicke, and concluded the latter was as reliable as the former. Here and there cases were seen which would give only the one test or the other.

As the spinal fluid is frequently negative to the Wassermann reaction in early syphilis, the cell count and Phase one, and especially the colloidal gold and normomastix reactions may prove of considerable diagnostic aid. But there are instances in which no laboratory evidence whatsoever is obtainable, and yet the possibility of a sleeping or dormant syphilis comes up. Here, if syphilis is really present, a provocative salvarsan injection often serves the purpose of bringing out a passing positive Wassermann in the blood, mostly twenty-four hours after the injection, also in the fifth, tenth and fifteenth day after. The positive Wassermann in the liquor is first noted some two to six weeks after the provocative injection. If the results prove negative, it is wise to repeat the provocative test about one to one and a half years later, and again examine both blood and liquor. If it is still negative, and there are no symptoms or signs of the disease present, one may with great probability say the syphilis is at an end.

The differential diagnosis of acute brain conditions following trauma and hemorrhage, and the later sequellæ, are taken up in a separate study (l.c.). The acute conditions in connection with the ear are also taken up in a separate study on the eighth nerve

[1]Footnotes and references will appear in the author's reprints.

Metastatic Carcinoma of the Pleura

*Report of a Case in Which Tumor Fragments Were Found in the Pleural Fluid**

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This case is of interest because, in the light of a history of carcinoma of the breast, the discovery of clusters of cells of malignant type in the sediment of a centrifuged specimen of pleural fluid, facilitated the diagnosis of metastatic carcinoma of the pleura.

CASE.—The patient, a married woman, forty-three years old, Hebrew, childless, was under the care of Dr. Joseph Blinder. In 1920 she had a tumor of the left breast, which was accompanied by paresis of the left hand without sensory disturbances. The blood Wassermann reaction was negative. In August of that year complete resection of the breast and axillary glands was performed. Thereafter the patient received x ray treatment over the left lung for a period of six months. She gained in weight and enjoyed good health until August, 1923, when she began to suffer from cough and a sensation of pressure in the chest. On examination, she appeared as a fairly well nourished, slightly orthopneic and cyanotic, middleaged woman. Except for the presence of crepitant râles at the right base, examination was essentially negative. There was no rise in temperature.

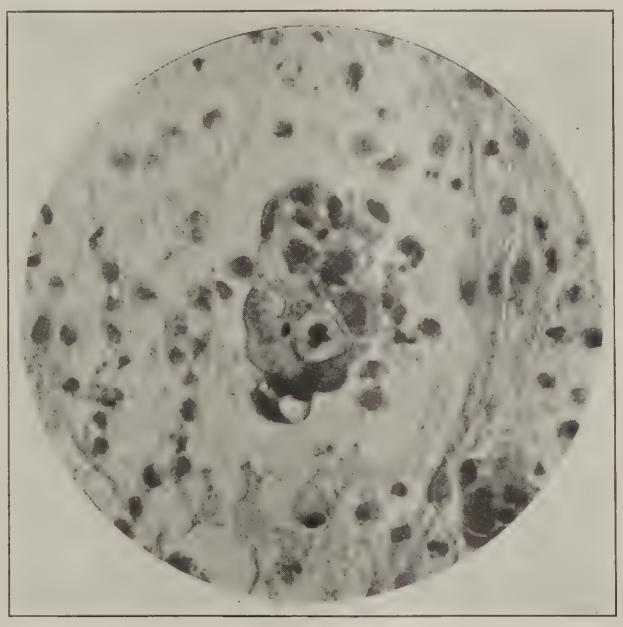

FIG. 1.—Photomicrograph x600 of a paraffin section of a centrifugalized sediment obtained from pleural fluid. This section shows a fibrinous meshwork which incorporates numerous inflammatory cells, among which no single type predominates. Small round, plasma and polynuclear cells are noted as well as numerous large endothelial types. There are occasional compact masses of large cells, the cytoplasm of which, in some instances, shows vacuolization. Amitosis is noted here and there. Occasional signet ring cells are noted. The presence of these various cells other than those of the inflammatory type probably points to a diagnosis of malignancy of the pleural cavity; but the exact classification of the tumor cannot be arrived at for lack of sufficient tumor cell masses. I am indebted to Dr. W. W. Hala for corroboration in the interpretation of this section.

Radiographic examination by Dr. Frederic Elliot on September 9th was reported as follows: With the patient in the horizontal position, the radiographic image showed a complete uniform veiling of the entire right pulmonic field, which, when the patient assumed the upright posture, showed the lower two thirds of the pulmonic field to have a similar uniform veiling bounded above by a crescentic line, convexity outward, with the upper third of the pulmonic field showing normal illumination and structural detail as compared with the opposite side. The left pulmonic field showed no tissue density changes suggestive of a metastatic new growth process. Conclusion: There was a considerable quantity of free fluid in the right pleura.

The chest was aspirated, and clear, amber fluid was withdrawn. A few red cells and many endothelial cells were present in the sediment of a centrifuged specimen. A portion of the sediment was treated with formalin, embedded in paraffin, sectioned, and stained with eosin and hematoxylin. Culture of the fluid was negative. One week later the patient died suddenly of asphyxia while in a sitting posture. Permission for necropsy could not be obtained.

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DISCUSSION

Attempts to establish a diagnosis of malignant disease from the character of cells found in the pleural exudate date back to Quincke's (1) report in 1882. Warren (2) in 1911, from a comprehensive review of the literature, to which he added three authenticated cases of his own, established the conclusion that very many cells undergoing mitotic division in serous exudates are almost diagnostic of malignant disease, that a small number of such figures is suggestive of malignant disease but is of no certain value in diagnosis, but that in the majority of exudates with malignant disease no division figures are seen. Powell and Hartley (3) state that when the pleura is involved in malignancy, there may be observed cells of large size and irregular shape, often vacuolated in appearance, and with the nucleus pushed to one side, so as to resemble a signet ring. The small number of mitotic figures found in the present specimen would place it in the category of one suggestive of malignancy of the pleura, while the antecedent history is such as to confirm the diagnosis.

It is a fact of considerable interest that, whereas the primary lesion was in the left breast, the right pleura was the one involved, and the left side of the chest was apparently free. It will be recalled that after the breast removal the left chest was intensively treated with x rays for a period of six months. Keeping in mind the experiments of Murphy, Maisin and Sturm (4), it appears possible that the intensive raying of the left side of the chest might have produced a state of local immunity. These authors in 1923 showed that autografts from spontaneous cancers of mice, when replanted into areas previously

exposed to an erythema dose of x rays, failed in the majority of instances (71.4 per cent.), while similar grafts into untreated areas grew in a large proportion of the animals (83.6 per cent.).

SUMMARY

The case report is that of a woman, forty-three years old, with a history of cancer of the left breast and a radical operation three years prior to her immediate illness, who exhibited symptoms, signs and a radiographic picture of pleural effusion on the right side. A paraffin section of the sediment of a centrifuged specimen of the pleural fluid showed large vacuolated cells, some signet ring forms, and a small number of mitotic figures. These findings are in themselves suggestive of malignancy of the pleura, and, in the light of the history, are probably diagnostic of that condition. The left lung was therapeutically x rayed for six months after the operation. This fact offers a possible explanation for the appearance of the metastatic growth on the opposite rather than on the same side.

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Mercurial Poisoning by Absorption From Vagina

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The following case presents clinical features of unusual interest:

Case.—E. H., female, aged twenty-four, white, American, maid, was admitted to the gynecological service of Dr. Rynd at the King's County Hospital, October 5, 1924. She gave the following story: The night before, for the purpose of preventing conception, she had inserted a bichloride of mercury tablet into her vagina. Within an hour she suffered severe burning sensations in the vagina and pain in the pelvic region. She then consulted a physician who advised immediate douching with milk and egg white. This was done. She suffered pain and burning sensations during the night and vomited twice, early in the morning. She then entered the hospital.

Upon admission she complained of burning and excruciating pain in the vagina; moderate pain in the lower abdomen; soreness and sense of pressure in the pelvis, and chills, weakness and drowsiness. She was in severe distress. There was nothing pertinent in her family history or previous personal history.

Physical examination, aside from a slight increase in the number of respirations, was negative except for the vaginal findings. The labia were markedly reddened and swollen, the labia minora being especially reddened and edematous. There was a grayish exudate in the vagina. The urethra was reddened and swollen. There was extreme tenderness on palpation in this region.

There was complete suppression of urine. At the time of admission the palate and pharyngeal structures were free from any pathological process. Until the fourth day the patient showed mild uremic symptoms and her clinical picture presented nothing that other cases of mercurial poisoning do not show.

On October 9th, the fourth day, the pharyngeal structures were swollen and a localized ulcerative area was making its appearance in the region of the left supratonsillar arch. On this day the blood chemistry report was: Urea, 235; creatinin, 6.5; sugar, 73 milligrams to the 100 c. c. of blood. The blood pressure was systolic 104, diastolic 65.

October 10th, the fifth day. An ulcerated area in the throat could be seen to be an area of true necrosis. This was unlike the ulceromembranous lesion of Vincent's angina; no organisms of Vincent-Plaut were found in the smears. There was no similarity to a diphtheritic process, for there was no true membrane, nor was there growth on culture. In fact no organism could be grown from this lesion. It did, however, strongly simulate the necrotic lesion seen in syphilis of the palate or pharynx. The short duration and sudden onset, together with the negative Wassermann reaction, ruled this out of consideration. It was therefore considered to be secondary either to the uremia or to the mercurial poison. The patient had not yet voided. The blood chemistry report was: Urea, 300; creatinin, 8; sugar, 70; Wassermann reaction negative.

October 11th, the sixth day, the area of necrosis above the left tonsil approximated the size of a twenty-five cent piece and extended deeply into the substance of the upper tonsillar pole. The palate and all the pharyngeal structures were swollen, which was not a true inflammatory reaction. The patient's temperature was 99.2° and the pulse 90. The blood chemistry report was: Urea, 330; creatinin, 9.2; sugar, 80. Blood pressure, systolic 94, diastolic 65.

October 12th, the seventh day, the throat showed essentially the same picture. Cultures and smears yielded no bacterial findings. Patient had not voided.

October 13th, the eighth day, a catheterized specimen of urine, less than five c. c., pus cells and renal cells were seen microscopically. The throat picture was essentially the same. Blood chemistry report was: Urea, 411; creatinin, 11; sugar, 76. Blood count, white blood cells, 11,300; polynuclears, 86 per cent.; red blood cells, 2,848,000; hemoglobin, 65 per cent. Patient had not yet voided.

October 14th, ninth day, patient voided for first time, five ounces. Injection and tumefaction of throat structures had disappeared. Area of necrosis was beginning to recede. Until the time that the patient voided her condition appeared desperate.

She was less drowsy but in very weakened condition. Pulse was 110; blood pressure, 75 systolic and 55 diastolic.

October 15th, tenth day, patient voided eighteen ounces of urine. Pharynx was healing. The patient was much brighter. Blood pressure, systolic 114, diastolic 70. Blood chemistry report was: Urea, 414; creatinin, 9; sugar 100. Mercury was isolated in the urine.

October 17th, twelfth day, patient voided urine in large amounts. Pharyngeal structures healing was rapid. Blood chemistry report was: Urea, 417; creatinin, 7.5; sugar, 107. Blood pressure, systolic 100, diastolic 75.

October 19th, fourteenth day, throat entirely healed. There was a sulcus between the upper tonsillar pole and the palate as a result of the destruction of tonsillar and palate tissue. The patient's general condition was markedly improved. She was brighter and sat up in bed a little. Blood chemistry: Urea, 354; creatinin, 5.5; sugar, 123.

October 21st, sixteenth day, the area of involvement in the throat was definitely healed. Blood chemistry report was: Urea, 258; creatinin, 2.5; sugar, 61. Blood pressure, systolic 105, diastolic 75. Patient sat up in bed.

October 22nd, seventeenth day, blood chemistry report was: Urea, 180; creatinin, 1.4; sugar, 80.

October 23rd, eighteenth day, patient allowed up out of bed. Blood chemistry report was: Urea, 162; creatinin, 1.5; sugar, 64.

October 29th, twenty-fourth day, patient discharged as recovered. Blood chemistry report was: Urea, 29; creatinin, 1.1; sugar, 32. The urine was positive for mercury on that day.

TABLE I.—BLOOD CHEMISTRY FINDINGS

Day of illness	Fourth	Fifth	Sixth	Eighth	Tenth	Twelfth	Fourteenth	Sixteenth	Eighteenth	Twenty-fourth
Urea	235	300	330	411	414	417	354	258	162	29
Creatinin	6.5	8	9.2	11	9	7.5	5.5	2.5	1.5	1.1
Sugar	73	70	80	76	100	107	123	61	64	32

The temperature ranged between 98° and 100.2°. The pulse ranged between 80 and 110.

The treatment was as follows: External heat was applied in the form of the electric light bath. Bicarbonate of soda was given intravenously, by rectal clysis, and in colonic irrigations. Caffeine sodium benzoate was used as a stimulant. The vagina was packed with vaselin gauze for its emollient effect.

The experience of our patient does not commend her procedure for purposes of prevention of conception. It is recognized that damage to the kidney function can follow the use of even a moderately strong bichloride douche. The clinical demonstration of this fact has been reported by Bland (1) and Sexton (2) in recent years. In an elaborate study of the question of the absorption of medications from the vagina, Macht (3) not only showed that absorption took place readily, but was so impressed with this phenomenon that he proposed this as a medium for the administration of such medicaments as opium and belladonna when other media were not available. This work was further commented upon editorially in the *Journal of the American Medical Association* (4). It is probable that this type of poisoning occurs more frequently than is believed. We have been able to collect six cases occurring in the past fifteen years in which poisoning was due to the vaginal introduction of bichloride tablets. In each of these cases there was a fatal termination. Schildecker (5) reported three cases with autopsy findings. He concluded that absorption took place through the lymphatics, and was exceedingly rapid. One of his cases terminated within twenty minutes of the introduction of the tablet. It is his opinion that unless the offending tablet is removed within a very few minutes the victim of the accident has little chance of recovery. Millar (6), Conaway (7), and Frederick (8) each report an experience with a fatal case. Recently Weiss (9) covered the subject of mercurial poisoning very thoroughly. He reports upon an accumulated series of one hundred and thirty-five poisonings with only eight deaths. His series does not seem to include poisoning per vaginum however. Nor does he mention having encountered a pharyngeal lesion in his cases. He stresses the presence of an acidemia in these cases and the importance of intravenous alkalinization.

Our patient who had absorbed mercury from her vagina, suffered an anuria for nine days, had an accumulation of creatinin in her blood as high as eleven milligrams to one hundred c. c. an area of localized necrosis developed in her palate and tonsil region which healed simultaneously with the favorable changes in her blood chemistry; and finally she recovered completely from the poisoning.

The palate and tonsillar necrosis which this patient presented, is of unusual interest. One of us is at present engaged in a study of the mucous membranes of the palate, pharynx and larynx in uremia. Barie (10) showed that there was a pultaceous exudate in the tongue and buccal mucous membranes in uremia. Pathologists tell us that uremics show localized areas of necrosis in various portions of the intestinal tract at autopsy. We have felt that the throat lesion which our patient presented was due to the uremia; not so much because of the negative findings for the other possible lesions, but because the throat picture cleared up as the blood content of urea and creatinin returned to normal. Mercury was still present in the urine on the day of discharge; it is hardly likely that this lesion could be accounted for on a basis of local mecurial effect. Barie reported ulceration of the same type in the oral cavity. Ulceration has been found in the esophagus (11) and intestines. The small series of uremias that have been studied would indicate that the severity of the local pharyngeal reaction is dependent upon the suddenness of the kidney insufficiency. In those patients who have a kidney lesion for a long time and uremia develops later there appears to be a mild reaction in the pharynx, palate and larynx; at times none or one that is barely noticeable. The severity of the kidney lesion or the abnormal blood findings in these long standing cases does not seem to affect the intensity of the local reaction of the tissues in the upper air passages.

The authors' references will appear in the reprints.

Practical Therapeutics

TREATMENT OF LOCOMOTOR ATAXIA AND THE PROPER METHOD OF GIVING INTRAVENOUS INJECTIONS OF MERCURY AND ARSENIC

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When the physician detects the early signs of a commencing tabes dorsalis, the patient presenting pain of the radicular type, ocular disturbances, paralysis of the external rectus, unequal and irregular pupils, paresis of the pupil reflexes to light, vesical and genital disturbances, absence of the osteotendinous reflexes, anal pruritus, and Romberg's sign, an extremely energetic antisyphilitic treatment should be immediately begun. For a long time it had been supposed that mercurial treatment was without effect on the evolution of locomotor ataxia and some observers even went so far as to pretend that the treatment might aggravate the disease. But in reality, at present, with the newer therapeutic agents at our command, these conceptions are not only erroneous, but are actually dangerous. By taking locomotor ataxia in hand at its onset and attacking the process by energetic treatment, not only can the progress of the disease be controlled, but an amelioration of all the symptoms may be obtained as well, to such an extent in some cases that it is about equal to a cure. It must be remembered, however, that the ingestion treatment is absolutely without effect, that intramuscular injections can only be a complementary treatment destined to continue the good effects resulting from intravenous injections, and that the only treatment that gives favorable results in the process under consideration is the endovenous one. Unquestionably, this procedure offers some disadvantages, the first of which is that it requires considerable skill on the physician's part, otherwise local accidents arise that are not devoid of danger. On the other hand, this procedure obliges the patient to make frequent visits to the physician, which is time consuming and expensive, since the treatment must be prolonged. Consequently it is the duty of the practitioner to make this clear to the patient in the latter's interest.

As has been said, intramuscular injections are absolutely insufficient. Injections of gray oil are useless; those of calomel in oil, recommended by Babinski, are very potent, but unfortunately, regardless of the various improvements made in the preparation of this oil, many patients are unable to tolerate it on account of the excruciating pain which it causes, so that its use should be restricted to tabes with muscular anesthesia, where it works wonderfully. Finally, injections of biniodide or benzoate of mercury are useless therapeutically. Therefore the treatment consists of injections of cyanide of mercury and novarsenobenzol.

The injections of cyanide of mercury should be given in a series of fifteen, at the rate of one every second day; the dose should be one cubic centimetre of the solution which contains one centigram of the drug. The treatment is generally well tolerated. If it produces intestinal disturbances, such as pain in the transverse colon or diarrhea, paregoric or tincture of opium will usually suffice to control these effects. If they persist, however, the treatment should be given up and resumed a few days later.

A series of fifteen injections should be given four times a year and twice yearly should be reinforced by a series of arsenical injections to which reference will be made. The cyanide injections are unquestionably potent and the reason why this treatment is not more general is because it offers certain technical dangers when the procedure is not carried out with exactitude. When from unskillfulness the mercurial salt is injected outside the vein, fearful pain ensues with inflammatory swelling, which soon becomes hard and extends over a considerable area. The patient's general health is affected, even with some elevation of temperature. In most cases sloughing occurs which takes considerable time to cure, and when recovery has taken place, a more or less considerable induration *en masse* results with occlusion of the veins whose permeability represents the patient's salvation. Other accidents may also occur which are equally dangerous. If the solution is simply injected alongside of the vein in a minute quantity, pain ensues with inflammatory swelling and a nodule forms which will occlude the vessel. On the other hand, if the injection is pushed into the centre of the walls of the vein, a nodosity will occur which obliterates the lumen. If the intravenous injection is not given adroitly, if the needle is thrust several times into the vein, the pain caused will discourage the patient and the changes arising in the walls of the vessel from the numerous punctures will result in small cicatrices so that after a time the vein becomes occluded to such an extent that it becomes useless for the procedure. Therefore, the technic must be acquired under the direction of men versed in it, and as this means practical work in a clinic, no mention need be made of it here.

But I would say a word as to the treatment of the accidents referred to above should they arise, and first be it said that the injection should be given slowly, because some few patients will be distressed if the injection is introduced suddenly. A kind of dyspnea results with paleness, due to the arrival *en masse* of mercuric cyanide in the bulbar region. When all the solution has been injected, it is well to aspirate a little blood into the syringe and reinject it. This little maneuvre rinses the needle of all trace of the mercury so that none is left to escape into the tissues when the needle is withdrawn, which otherwise might give rise to mild accidents.

If a little of the solution should be injected along the outside of the vein, the following measures must be resorted to without any delay: Fifty cubic centimetres of sterile water should invariably be ready at hand, to which one centigram of cocaine hydrochlorate is added. A needle is then pushed in *under* the point at which the mercury solution has entered the tissues and twenty c. c. of the cocaine solution injected. The needle is then withdrawn a little and ten c. c. of the solution injected.

TRYPARSAMIDE IN NEUROSYPHILIS*

HERMAN P. HYDER, M.D.

Washington, D. C.

(*Concluded from page* 568)

Nine treatments of tryparsamide and eight treatments of mercury were given and his serology on October 18, 1924, was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	2 plus
Globulin	2 plus
Cells per c.mm.	6
Gold sol.	5555321000

This patient has improved materially from a clinical standpoint. When placed on treatment it was necessary for him to have assistance when walking; now his locomotion is fairly good, though he still has some loss of control of his legs.

CASE XIX.—Diagnosis, general paresis. This patient gave his age as forty-seven when admitted. He was confused, showed gross memory impairment and speech defect. He seemed to be much deteriorated. On November 5, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	39
Gold sol.	5555430000.

He received eight treatments of tryparsamide and nine injections of mercury. On April 4, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	plus
Cells per c.mm.	6
Gold sol.	5544321000.

He was again treated, receiving nine injections of tryparsamide with ten of mercury. On December 4, 1924, his serology showed:

Wassermann, blood	Neg.
Wassermann, spinal fluid, Neg. singles and doubles, 4 plus in quadruples	
Globulin	2 plus
Cells per c.mm.	14
Gold sol.	5554321000.

This patient has responded much to treatment from a clinical standpoint.

CASE XX.—Diagnosis, general paresis. This patient came under our observation on March 9, 1924. Aged thirty-two years. He contracted syphilis in 1917. He was described as showing emotional deterioration and impairment of memory. He was euphoric and indifferent. His pupils were unequal and sluggish in reacting. He was rather poorly nourished. On March 12, 1924, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	34
Gold sol.	5543210000.

He had eight treatments of tryparsamide and nine treatments of mercury. On July 2, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	8
Gold sol.	5554432100.

He was now given nine treatments of tryparsamide and took mercury by inunction. On November 13, 1924, his serology showed:

Wassermann, blood	2 plus
Wassermann, spinal fluid, Neg. in singles; 3 plus in doubles; 4 plus in quadruples	
Globulin	plus
Cells per c.mm.	6
Gold sol.	2222430000.

This patient is now in good condition mentally and physically, is living away from the hospital and is getting along well.

CASE XXI.—Diagnosis, general paresis. This patient was forty-seven years old when admitted May 16, 1924. He entertained delusions of grandeur with the other symptoms of the expansive type of paresis. He gave a history of chancre, 1911. On May 21, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	18
Gold sol.	5554421000.

He had ten treatments of tryparsamide and his serology on September 4, 1924, was as follows:

Wassermann, blood	1 plus
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	8
Gold sol.	4555432000.

He was given an additional ten treatments of tryparsamide, four injections of mercury and some mercury by inunction. On February 3, 1925, his serology was as follows:

Wassermann, blood	1 plus
Wassermann, spinal fluid	2 plus
Globulin	Neg.
Cells per c.mm.	2
Gold sol.	5544320000.

This patient has made a complete change mentally. He is quiet and orderly; all delusions have disappeared and he is in excellent condition physically.

CASE XXII.—Diagnosis, general paresis. This patient is thirty years old and gives a history of chancre twelve years ago. When admitted he was in only fair condition physically, while mentally he was somewhat deteriorated, showing the clinical picture of paresis. On May 9, 1923, his serology was as follows:

Wassermann, blood	4 plus
Wassermann, spinal fluid	4 plus
Globulin	2 plus
Cells per c.mm.	22
Gold sol.	5554321000.

He was given ten treatments of tryparsamide when his serology showed:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	3 plus
Cells c.mm.	9
Gold sol.	5554320000.

With no additional treatment his serology was as follows, January 16, 1924:

Wassermann, blood	Neg.
Wassermann, spinal fluid	4 plus
Globulin	4 plus
Cells per c.mm.	53
Gold sol.	5544432000.

When about six months had elapsed since his treatments were discontinued, he was given another ten intravenous injections of tryparsamide and on November 13, 1924, his serology was as follows:

Wassermann, blood	2 plus
Wassermann, spinal fluid, Neg. in singles, 4 plus in doubles and quadruples.	
Globulin	4 plus
Cells per c.mm.	4
Gold sol.	4555532000.

While this patient's serology has changed slowly,

*This paper was read before the American Congress on Internal Medicine, March 9 to 14, 1925, at Washington, D. C.

he has improved markedly from a clinical angle. He is quite a contrast to what he was when first seen.

Tryparsamide was given in three gram doses at weekly intervals to these patients. Salicylate of mercury was given in one grain doses and blue ointment was given by inunction. Each patient's eyes were examined during the period treatments were in progress, but no acute eye symptoms were discovered.

Of the twenty-two cases reported, sixteen were general paresis, two were taboparesis and four were cerebral syphilis. Of the twenty-two cases, fifteen, or sixty-eight per cent. of the whole number treated, showed improvement. Two of the paretics were very unfavorable cases for any kind of treatment and they were put on this treatment for reasons other than the expectation that any great benefit might result. Two others were poor risks. Sixteen paretics were treated; eleven had tryparsamide with some form of mercury; five had tryparsamide alone. Seven were unimproved; two of this number died. Nine paretics out of the sixteen showed improvement. Both cases of taboparesis improved. Each of the four patients having cerebral lues who were treated with tryparsamide, showed much improvement.

An effort has been made, in noting the condition of the patients, to consider them from a clinical viewpoint as well as from a laboratory level; but, as stated before, it seems to me that the clinical angle is the more important, for little is accomplished when a patient's serology becomes less strongly positive while his mental and physical condition does not show corresponding improvement.

Those who have made a thorough study of neurosyphilis and understand the makeup of the tissues involved, and the nature of the existing pathology, are hesitant when any new drugs or new methods of treatment are heralded as a panacea for this condition. Among the results thus far reported, probably those given by Lorenz and his coworkers are most impressive because the period intervening, since treatments were instituted, was quite long. The comparison given by Solomon and Veits between tryparsamide and the other arsenicals is also quite interesting and instructive.

Because of the small number of cases under consideration the writer will not attempt at this time to discuss the relative value of this and other methods of treatment, aside from merely pointing out that the final results obtained with tryparsamide as with other modes of therapy, depends largely upon the stage to which the disease has progressed when treatment is instituted. The sooner the case is diagnosed and put on treatment, the more favorable the results to be expected.

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Treatment of Rheumatic Fever with the Ethyl Ester of Phenylcinchoninic Acid.—C. Philip Miller and Ralph H. Boots (*Journal of Laboratory and Clinical Medicine,* October, 1924) treated eight patients ill with rheumatic fever with the ethyl ester of phenylcinchoninic acid, the method of administration being the same as that described for neocinchophen, i. e., one gram of the drug each hour until the appearance of some evidence of therapeutic effect or of drug intoxication, at which time the drug was discontinued for that day. On succeeding days the patient was kept well under the influence of the drug and as free as possible from toxic symptoms, or in other words, an effort was made to maintain the maximum subtoxic dose. The amount varied considerably and had to be determined for each patient, but in general corresponded to the dose which was necessary for neocinchophen. The period of administration varied from four to forty-one days. Coincident with the relief of the arthritis there occurred a disappearance of fever and rapid heart rate. As with neocinchophen, a bradycardia was frequently noted during the first week of administration. This drug also gave rise to toxic symptoms, similar in character to those of salicylism, but milder in degree. While no definite general conclusions can be drawn from this small series, the possibility is suggested that the ethyl ester of phenolcinchoninic acid is less toxic than neocinchophen.

Intravenous Use of Mercurochrome.—F. S. Hopkins (*Boston Medical and Surgical Journal,* October 16, 1924) says that his experience with the intravenous use of mercurochrome has not equalled his expectations. Of twelve cases there were five in which it was of no benefit, five of temporary or doubtful benefit, and two in which it seemed to be of definite value. But even in these two cases it is impossible to prove that the results obtained were due to the use of mercurochrome. The reactions following its use were not alarming, except in one case, in which a rapid and irregular pulse followed; this responded promptly to digitalis. He does not believe that the intravenous use of mercurochrome should replace any generally recognized indication for surgical treatment. Still he feels that in cases of infection that are not readily controlled by simple surgical procedures it is of sufficient value to warrant continued trial. In cases of septicemia he thinks it should always be used, for it offers a hope of cure in an otherwise usually fatal condition.

Complications Following the Use of Mercurochrome—220 Solutions.—Ben N. Wade (*Northwest Medicine,* November, 1924) says that while mercurochrome-220 is a valuable germicide, and can ordinarily be safely used, the following precautions should be borne in mind:

1. It should not be used in deep and poorly drained cavities or sinuses continuously over a long period of time. When indicated in such cases, it should be used at intervals.

2. When used intravenously, it should be given only in urgent cases and then with caution.

3. Strong solutions should not be used until after weaker strengths have first been tried out.

4. Stomatitis may result from the use of weak solutions, one per cent solutions having produced it

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The Morphological Factor in Respect of Rheumatism and Other Affections of Joints

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London

Whenever we seek to enumerate and appraise the many and various factors that may and do determine the incidence of rheumatism and other affections of joints—whether in respect of persons, or of special parts and structures in particular persons—there is one which, in the country of Oliver Wendell Holmes at least, should be ever present to our minds. I refer to that etiological component classically indicated by the theory of the *locus resistentiæ minoris,* but better understood when we declare, in the words of the immortal and philosophical Deacon, that "the weakest part must stand the strain." It is sometimes said, and not without some measure of truth, that this proposition, like most, if not all scientific theories, depends for its proof upon use of the artificial fallacy known as the *petitio principii,* or, "begging the question." That is to say, we, too commonly, find proof that the part affected is really the weakest, in the fact that it is indeed the part affected; and we seek to demonstrate that the weakest part will break down the first, by showing that it is certainly the weakest. Now, although this sort of circular reasoning is immensely popular in medical circles since the abandonment of the study of logic, and although we have come to believe that nothing is necessary for the discovery of truth save observation of what we call facts, there is something that can properly be said, in support of the Deacon's thesis, that does not involve the adoption of any fallacious reasoning. We can show, for example, that the structures and organs which are most often affected are those found to be inferior when some standard other than the medical is adopted; and we can also show that, in many cases, affected parts are those which must be judged inferior by the anthropologists or comparative morphologists. If we do this we achieve a scientific demonstration. For the difference between a truly scientific demonstration, and one that is unscientific, is this: scientific proof depends upon and brings to our minds considerations outside the sphere of the original problem, while unscientific proof teaches us nothing new, opens up no new horizon, and brings us back in our own tracks to the point from which we started.

My first proposition then is that the parts and tissues most easily and most often affected by environmental and accidental stresses are those which, judged by the standards of comparative morphology, are distinctly inferior: that is to say, are those which are the less evolved, when compared with their like, and which exhibit reversionary characters in one or other respect, or at any rate preserve embryonic or infantile features.

Indeed, it is by the morphological characters of any part that the functional organization thereof can best be judged.

Sometimes we can obtain no direct evidence as to the morphological characters of the parts chiefly affected, as we say, by certain diseases; but we can generally obtain such evidence in respect of correlated structures, and so judge of what is hidden.

For example: most asthmatic and croupy infants possess only two lobes to the right lung, and an epiglottis that is defective in form. We can infer as much when we see the snubby nose and the tiny nasal orifices. Most children who come before us with acute mastoiditis have aircells which are badly developed. We should guess that when we observe how defective are their auricles and lobes. Many cases of socalled neurotic abdomen have loose mobile cecums and kidneys: sometimes persistent Meckel's diverticula. I have diagnosed the latter abnormality when I have noted the patient's fissured tongue. Children who wet the bed when young, and in later life are sexually ineffectual or perverted, display as infants, if male, an undifferentiated scrotum; if female, labia defective in an artistic sense.

Indeed, the less any external part or member conforms to the Greek standard, the more does it approach the standards of primitive races and the anthropoid apes; and the more likely is it, and the organs correlated with it in function, to break down under strain.

The liability is even greater if, not so much is any one primitive type conformed to as is the part or organ dysharmonic, and a complex of several primitive or recessive types.

After all, this is only to say what every artisan

knows; that, when certain parts of a complicated structure are below the best standards in respect of form and finish, they will certainly break down under stress sooner than should be the case, and are probably made of inferior material. Moreover, a simple or harmonic design is an excellent gauge of probable efficiency; while a motor car or one hoss shay that is, in respect of its lines, a compromise between two types (each excellent in its way) is pretty sure to be a practical failure.

How can we apply these general principles to the case in hand: the liability to rheumatism and other arthritic affections? Clearly, we have to deal with at least two categories, or classes, of inferiority. There is the general liability to infection, or to metabolic error; and the particular liability of particular structures to be affected, in presence of infection, metabolic error, mechanical strain, and so forth. It has long been recognized that persons liable to acute rheumatism tend to conform to a certain anthropological type: there are likenesses in respect of complexion and skin, hair and eye coloring. Again, the French believe firmly that chronic arthritics possess what is called the arthritic diathesis: that such persons are liable to certain nonarthritic maladies, notably psoriasis and other affections of the skin. All this is true enough, in the sense that it is a generalization from experience. And I have the impression that those who suffer from acute rheumatism are persons in whom the lacunar system—the lymphatic and serous complex—offers less resistance than is normal to certain infections. On the other hand, chronic arthritics perhaps share in common some inferiority of certain tissues. At any rate, it is not strange that children in hospital with rheumatic fever, and chronic arthritics at spas and watering places, should display the kind of likeness to each other that Dr. Draper has demonstrated as observable, in terms of precise measurement, between persons suffering from certain other diseases. (See *Human Constitution*, 1924.)

It is not, however, with this category of inferiorities and liabilities that I am anxious now to deal, and I would say definitely, both as a challenge and as a statement of experience, that the affected joints and correlated structures of persons who are the subjects of rheumatism and the rheumatoid affections are so often markedly inferior, from the point of view of the morphologist, that we are justified in asserting a correlation between morphological inferiority and liability to certain joint affections. That is to say, persons who exhibit such inferiorities are more liable (*caeteris paribus*) than are others to break down in respect of the inferior parts, under stress. The importance of this correlation is twofold: it gives us a guide in prognosis, and it is of educative value. Our prognosis and our treatment, of one order when etiological responsibility attaches chiefly to occasional or accidental stresses or strains, must be quite otherwise when such responsibility is to be chiefly allotted to "original sin" in respect of functional inadequacy or structural defect. We should never say of any human being, as we may say of a motor car, that it is "not worth repair." But we can at least avoid "repairs" that impose a greater strain than can well be borne, and we can refrain from promises that are as delusive as the means employed are costly.

Before referring in general terms to the kind of characters met with in the hands, the hips, and the lumbosacral spines of certain arthritic patients, there are one or two points of some interest that may be noted. The kind of defect met with, in respect of configuration, or morphological inferiority, is usually one already indicated when the cartilage is laid down. It is existent, as a rule, before osseous outlines are defined. The cartilaginous and fibrous tissues are themselves inferior as materials (or hypoplastic) as well as in modelling. Sometimes there is osseous hypoplasia as well, as in many rheumatoid young women. But the osseous hyperplasia that is so common in adults and seniles, and sometimes occurs in the young, appears to me almost always best considered as a well intentioned but ineffective compensation: a compensation that, like many others, goes sometimes to excess. Another point is that, in some cases, as in tabetic arthropathy, there is what an Irishman may call regressive tissue hypoplasia, under trophic influences. Trophic influences, so largely ignored by the physician and physiologist (because not normally obvious in the decentralized, fully organized and specialized community of cells and organs that we call an adult) are more obvious, and more active, in the centralized, unspecialized and undeveloped or regressive communities that we call the child and the senile respectively.

But differently; in the normal adult there is greater local autonomy. A normal adult, if rheumatoid, is usually monoarticular, from the clinician's point of view, because of local defect or local strain, and because what with him affects a part does not greatly affect the whole.

But the child, and the senile, if affected locally, suffer *as wholes*. They are affected, not only locally by local stresses, but generally by whatever weakens the whole and lowers central trophic control and stimulation. In fact, the older or the younger the patient, other things being equal, the greater the tendency to generalized affection. The better developed, the more normally adult the patient, the greater the tendency to localization in a joint particularly affected by stress, or specially defective morphologically.

Turning now to some specific points, if we examine the hands of people about us we find that, roughly speaking, two types emerge as differing from the mean, and yet as being congruous, or harmonic. Of these, one is long and osseous; the other, short, plump, and supple. The long and osseous type corresponds, in a racial sense, to that of the non-Mongolian primitive peoples, and, pathologically, to Marie and Cushing's hyperpituitary *main en large*. The other corresponds racially to that of the Mongolian races and, pathologically, to the hypopituitary *main en petit*. But I am only speaking in broad terms. Now, grouped around these two types, and the third "mean" or normal hand of white races, we find others. Some of these are composite, or mixed—dysharmonic. They are often rheumaticky hands. Others, while conforming in a way to the second, hypoplastic, or racially Mongolian type, are yet something more. They remind us of the hands of the Mongolian imbecile, or of the achondroplastic, or of something else! And such hands as these are often seen among those who are subject to rheumatic fever,

or the polyarticular rheumatoid affections. We note, n these cases, amyotonia, short incurved little fingers, small thumbs, an irregular digital formula, short, or llformed last phalanges and irregular metacarpal arrangements. Often enough the patient will say: 'Yes, Doctor. Have I not funny hands. And my feet are just the same!" So, on removing the stocking we may see a chubby foot, with a row of absurd oes all the same length as in some Oriental peoples. And so on.

Many varieties of this kind of morphological inferiority might be mentioned, but I can only here refer to one: that which my friend André Léri has described as *Pléonostéose familiale*. Here, in this familial, almost congenital, condition or disease, we have to do with a malformation and compensatory hyperosteosis that seems, as it were, both pathological and atavistic. For the hands of the patients are, as are the hands of the Lapps, and as are in less degree those of not a few persons who become the subject of true osteoarthritis. In respect of this notable affection, and of many other structural and skeletal conditions—half disease, half deformity—the remarkable articles in Fascicule XXII of the *Nouveau Traité de Médecine* should be consulted.

Now, if we turn from the hands to the hips, we find that Calot, of Berck-sur-Mer, has shown, what some of us had long thought, namely, that in many cases of what have been called special affections of the hip, whether in youth or in age, and in many cases of socalled arthritis deformans of the hip, we have really to do with a hip that is, in principle, a more or less marked instance of a congenitally dislocated hip. Acetabular imperfection is clearly marked. So, once more is the Deacon justified. We have a long series, as it were, of cases with congenital deformity, or grades of deformity, passing from the frank congenital dislocation at one end of the scale to senile arthritis at the other: to osteoarthritis, that is, supervening in respect of a hip which, in early life, did not quite develop, as we say, normally.

We all know how commonly the hip is affected by rheumatism and by rheumatoid disorders. Why should it be that, in such an important structure, there should be, as I for one believe is frequently the case, such a range of developmental variation as Calot's work suggests?

Some hint of a solution is afforded if we pay attention to the work of Klaatsch, and Sera (alluded to in my recent little book *The Mongol in Our Midst*) which seems to have established the existence of at least two types of femur among mankind —fossil and extant—and the great anthropoid apes. Of these, the one is coarse and the other slender: in the one the neck is set to the shaft at a less open angle than in the other; and there are other differences, of torsion and the like, which are important. The two types correspond to, and are correlated with, the two hand types already described. In the second —the Mongol-Orang type—there is a greater tendency to laxity of the hipjoint; for the orang has no ligamentum teres: and the acetabulum is not as in the other. Now, as Sera suggests, the first type is the less, the other the more, adapted to arboreal life; but, as I have shown, the first type is adapted to squatting with the lower limbs in vertical planes; the second, to the Buddha position. And—this is the important point—while both these types are met with among the socalled white races (though less commonly than a middle, or normal type) yet, very frequently, not only is congenital dislocation of the hip of the typical kind, but the minor degrees of that condition (described by Calot as associated with forms of arthritis) very common in hypogenetic persons who exhibit Mongolian or semi-Mongolian characters. My suggestion is that many of these cases of imperfect development in a morphological sense that in later life have rheumatoid changes clearly superimposed, are persons who, when in the embryonic, fetal, or infantile stages of life, hesitated at the crossroads of development by reason, as Samuel Butler would have said, of confused memories. This is not fanciful: it works. The facial characters alone give the hint: the x rays make for assurance. And this is the central fact: the hip joint is a pivotal structure in more senses than one, for human and ape types may be grouped more surely in respect of the morphology of the hip and femur than of any other structure or organ that can be suggested.

Sacralization, as it is called, of the fifth lumbar vertebra is a cognate topic, and for the best of reasons. There is a definite correlation between the second or Mongol-Orang type of femur and pelvis, and a tendency to sacralization of the fifth lumbar vertebra. This is because the Buddha position tends to require a firmer lumbosacral support for the spine than does the ham, or buttock squatting position, with the lower limbs arranged vertically.

Now the subject of sacralization, which has been so ably discussed by Meynadier, in a recent *Thèse de Paris*, is one that is of double interest in connection with the rheumatoid affections. In the first place, abnormalities of the lumbosacral spine are organ inferiorities in the sense of Adler: they are *indicia*, not merely of skeletal inferiority, but of cerebrospinal, and so of psychological imperfection and perhaps of trophic functioning. Secondly, they exemplify once more the Deacon's teaching, for, as any one may satisfy himself, there is a definite correlation between them and the spinal incidence of infective, traumatic, and metabolic stresses. At the same time it should not be forgotten that persons displaying these abnormalities or inferiorities are more prone than are others to complain, after accident or strain, or lumbar puncture, of pains and of rheumatisms that improve greatly after the attention given by osteopaths and denied by the orthodox. However envisaged, the lumbosacral spine and the hipjoint form together a complex that is of enormous anthropological significance and pathological importance.

In drawing the attention to some unconventional lines of thought and observation, I am anxious not to be thought careless of the importance of what may be called "more practical considerations." But it is as least as practical to distinguish between the effects of a strain or infection upon a normal joint, and the marked effects of a slight strain or infection upon a defective joint, as it is to resect the colon, or embark on a course of vaccines against an unknown bacillus, when a congenitally weak hip is yielding under mechanical strain! In any case, truth cannot fail to be useful, while there is no need for it to be

feared, save by the charlatan. And there is a charlatanry of thought within the pale as well as a charlatanry of action, outside it. A disease is no thing with external existence and objective characters. Disease is a function of at least two variables, whether we call them soil and seed, organism and environment, or one hoss shay with Deacon as a load. We must study both variables, and appreciate both variables, never losing sight of the truth that it is the relation between them that constitutes the disease, and that is evidenced by the symptoms. What we call organic disease is the effect of the relation, and not the cause of it.

The broader our conception of the complexity of this relation we call disease, the better our diagnosis. For, after all, diagnosis is appreciation of the patient's present situation, and of how it has been brought about. It is not the summary identification of the obvious symptoms and signs with an account given in a textbook and known by a class name.

Endocrines in Relation to Rheumatic Fever and Rheumatoid Arthritis

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To look at timeworn problems from an unwonted angle is always interesting and not seldom illuminating. For that ancient maxim *Audi alteram partem* is but too often forgotten in the sphere of medicine as elsewhere. Especially in the domain of etiology are we likely to overlook the "other side." Thus, we have been affirming so loudly and so long that "rheumatic" fever must be an infection that the obsession has nigh blinded us to all aspects of the disorder that might clash with the preconception.

But assuredly there is another side. One of etiological import, too, and not necessarily antagonistic to the infective hypothesis but complementary thereto. Thus, important as bacteria are, they are still of less importance than the cells and tissues they infest. For if these latter provide not suitable cultural conditions the invading microbe fails of its end —infection. How urgent then the call for more light on what may be termed the intermediary pathology of rheumatic fever! On those important factors or conditions that determine whether an intruding microbe shall achieve infection or suffer mere sterile implantation, and to development of this aspect we now proceed.

Now, the phenomena of "rheumatism" in childhood clearly indicate that it is not primarily a disease of joints—surely an etiological hint of prime significance. Nevertheless, when in older subjects joint swellings dominate the clinical picture we not only forget this point but allow their presence to color all our conceptions of the nature and etiology of the disorder, and straightway for many this widespread constitutional disorder shrinks in its clinical content and becomes in effect merely an arthritis. Moreover, despite the *sui generis* character of the joint swellings their fleeting migratory habit and lack of residual changes—so foreign to other infective or streptococcal arthrites—we nevertheless assume them to be of like origin. Apart from this, does not their specific response to salicylates, comparable only to that of colchicum in gout, of itself suffice to stamp them as *sui generis* seeing that other infective or streptococcal arthrites are rebellious thereto.

But to resume, does not the difference—*qua* joint involvement—between the rheumatism of childhood and the rheumatic fever of older subjects indicate that the joint swellings do not represent a further stage in evolution of the life history of the disorder. For presumably the basic etiological factors of the rheumatism of childhood—in view of their cardiac manifestations—are common also to the rheumatic fever of adolescents or adults.

Whence then the difference in clinical facies prior to and after the passing of puberty? Must not the immature tissues of a child differ profoundly from these same tissues when activated by the genital hormones that flood the circulation at the advent of puberty? Surely it is these tissue contrasts that dictate the disparate nature of the clinical reaction to the rheumatic virus, whatever its nature?

Nowadays we think much, and rightly, of the malign effects of infection on the endocrine glands; but have we not here a clear indication that the process is reversible, viz., that if infections can modify the endocrine glands, so also can the endocrine glands modify the tissues' reaction to infections? Is not this further inference then justified, viz., that hereditary or congenital endocrine disabilities may profoundly modify the reaction of the organism to infection? May it not yet transpire that an infection say falling e. g., on a subthyroidic substrate may evoke a different reaction than if it fall upon one of normal endocrine constitution? It can scarcely but be so since we admit that the thyroid and other endocrines influence profoundly the metabolism of all the body cells.

Now, there is, I think, considerable evidence that the hereditary and familial tendencies to rheumatic fever are transmitted via the endocrine glands—that *ab initio* children of socalled rheumatic stock are handicapped by their heritage of endocrine and notably thyroid instability. That under the influence of infective nutritional and other factors the latent tendency to generalized dysfunction of the endocrine and autonomic systems is unmasked—revealing itself in divers ways. Hence the reason why these rheumatic children are given to idiosyncratic reactions, display a penchant for disorders that are paroxysmal and periodical, and these moreover prone to clinical reaction and alternation.

Does not the very diversity of the elements of what Cheadle termed "the rheumatic series" in chil

ren clearly indicate that infections are but excit-ng factors, evocative rather than causative and uite subordinate in importance to the inherited pre-isposing factors—the tendency to endocrine imbal-nce with its correlated and clinically indissociable utonomic imbalance. Let us now proceed to ascer-ain what evidence there is that the clinical vagaries f the rheumatic child are linked up with endocrine bnormalities.

IORBID PROCLIVITIES OF THE RHEUMATIC CHILD

The essential attribute of the rheumatic child is nstability or hypersensitiveness. He is, par excel-ence, of the hypertonic neuropathic kind, highly maginative, excitable, very susceptible to cold, and eadily fatigued. All, again, have noticed their ten-lency to emotional crises, night terrors, stammering, nuscular tremors, athetotic movements, what Good-art terms subchorea and last but not least, their endency to tetany.

Their inborn instability is further disclosed by ymptoms indicative of vasomotor ataxia—cold ex-remities, dead fingers, chilblains, or true Raynaud's lisease. Also, by their proneness to fleeting urti-arial or erythematous rashes, to cyclical vomiting, outs of epigastric pain with diarrhea, or mucous olitis, not to mention asthma, and migraine, and noreover by the striking manner in which these arious syndromes may alternate with each other.

In reviewing this veritable medley of disorders, he conclusion seems inevitable, viz., that they are he outcome of an inborn predisposition—a diathesis f, I believe, a neuroendocrinopathic kind. Endeav-oring to find some common etiological bond for these livers syndromes, I some time since suggested that the live link in rheumatic as in asthmatic heredity was the transmission of a tendency to protein sensi-ization. For recalling the resemblance obtaining between the phenomena of serum sickness and rheu-matic fever such an hypothesis might explain the otherwise inexplicable interplay of the articular and abarticular manifestations of the latter disorder. But even so, through what medium is the hereditary transference of a tendency to protein sensitization secured? Does it constitute another phase of endo-crine or glandular heredity?

ENDOCRINE INSTABILITY IN RELATION TO THE RHEUMATIC CHILD

The apparently disconnected elements constituting the rheumatism of childhood seem highly suggestive of some inborn state of endocrine and autonomous imbalance. I use the term imbalance advisedly, for, imbalance connotes instability. Now, instability in the endocrine sphere implies neither hyperfunction nor hypofunction, but an alternation or mingling of the two states—with correlated variations in the sympathetic system in the direction of excitation or depression.

Thus, in common with others, I have met with evidences of hypothyroidism, e. g., solid edema, as well as of hyperthyroidism in Graves's syndrome. Indeed, as we know, the cardinal symptoms of Graves's disease may persist despite the development of myxedema through thyroid exhaustion. Recog-nition of this fact, viz., that signs of hypersecretion may coexist with those of hyposecretion, will, I think, help us to unravel the tangled skein presented by the phenomena of rheumatism in childhood.

EVIDENCES OF HYPOTHYROIDISM AND HYPERTHYROID-ISM IN A RHEUMATIC CHILD

Out of the somewhat bewildering congeries of morbid signs and symptoms presented by children of rheumatic stock, their liability to tetany and also to symptoms of vasomotor ataxia stand forth from the endocrine viewpoint as the most arresting features.

Their proneness to tetany has long been known. Remarked by Goodhart it was recently emphasized by McCarrison's observation that "Rheumatism is frequently associated with tetany." Indeed this tendency to tetany seems to run like a thread through the life history of the disorder, as it crops up again in the rheumatic fever of older subjects. It may arise actually during its course, but more often after its close when—as I have observed—it may form an interconnecting syndrome between rheumatic fever and a subsequent rheumatoid arthritis—its origin attributable perhaps to the hypothyroidism that so often follows the former disorder. Moreover, just as at the close of rheumatic fever symptoms of Graves's disease may arise, so also, in the declining stages of tetany have Kahn and Falta seen the thyroid enlarge with marked symptoms of exophthalmic goitre.

Now, tetany is avowedly due to thyroparathyroid defect. Its association not only with Graves's syndrome, but also myxedema, is acknowledged, and more especially with goitre. Its kinship with these disorders is the more significant in that they are all distinctly of hereditary and familial trend—especially goitre. The children of the goitrous tend to be goitrous—but this not necessarily through hereditary transmissions as in regions where goitre is endemic the same causes may be operative in parent and offspring. On the other hand, if the goitre be accompanied by thyroid insufficiency, this subthyroidic taint is hereditarily transmitted to the offspring. Now, women when goitrous and subthyroidic are extremely prone to tetany—a symptom in itself of thyroparathyroid insufficiency, and the subthyroidism thus disclosed is handed on to their offspring with its correlated liability to tetany.

Now, children of rheumatic stock are also liable to tetany, and therefore similarly suspect of thyroparathyroid inadequacy. Moreover, my own experience leads me to suspect that a subthyroidic taint in parents entails on their offspring not only a special liability to tetany, but to rheumatism and rheumatic fever, as also to the rheumatoid or atrophic and osteoarthritic or hypertrophic types of arthritis deformans. For I have noted the following points which appear to be of etiological import:

Firstly.—That in regions where goitre is endemic the incidence of rheumatic affections appears to be abnormally high. So much so, that practitioners migrating from a nongoitrous to a goitrous locality, are immediately struck thereby; not only by the number of cases of rheumatic fever they meet with, but the frequency with which cardiac lesions—not preceded by rheumatic fever—occur. Also, by the frequency with which cases of rheumatoid arthritis are encountered, and incidentally, I may remark, that as

far back as 1902, I pointed out the frequency with which rheumatoid arthritis and Graves's disease coexisted (1). Moreover, having observed in instances of preexisting Graves's syndrome that recession of the thyroid swelling was followed by rheumatoid arthritis, I suggested the administration of thyroid gland (2), the good effects of which in well chosen cases of rheumatoid arthritis are now well established.

Secondly.—That if rheumatic fever develops in the child of a goitrous mother it shows a strong impetus to chronicity, being rebellious to salicylates. Also, if it occurs in a child, not necessarily with a mother actually goitrous, but living in a region where goitre is endemic, it may show the same peculiarities. Now seeing that goitre and subthyroidism are frequently associated, and that subthyroidism is markedly hereditary, it seems to indicate that the hereditary and familial tendencies to rheumatic fever are transmitted through the endocrine glands—notably, but not exclusively the thyroid. Also, that the nonresponse to salicylates is linked up in some obscure way with thyroid or thyroparathyroid defect or instability.

Thirdly.—That this obduracy to salicylates relents if in addition thyroid therapy be invoked—the thyroid appearing to activate the otherwise impotent salicylates. This renders more plausible my suggestion that this rebelliousness to salicylates is bound up in some subtle way with the thyroid deficiency or instability. Now, apart from definitely goitrous regions, the present fashion of exposing the necks clearly shows that goitre is far more common in adolescent girls than was previously suspected. Accordingly, our search for the minor evidences of thyroid insufficiency in such subjects is urgently indicated. The more so if, as I believe, subthyroidism connotes a special liability to rheumatic affections. For if so, it follows that the original predisposing factors that make for the development of rheumatism in childhood, and of rheumatic fever in older subjects, ought to be sought for in those conditions—intrinsic and extrinsic—that determine the production of subthyroidism.

To resume, the subthyroidism of rheumatic children is further tokened in that they are often ill nourished, do not grow or put on weight, like other normal children of their own age, i. e., arrest of development. Again, their temperature is often subnormal, their skin dry and harsh, their hair sparse on scalp and outer side of eyebrows, with deficient appetite and constipation—signs all of them of hypothyroidism.

Additional evidence of their subthyroidism is to be found in their tendency to vasomotor ataxia—symptoms due to correlated lowered excitability of the sympathetic system, viz., slow pulse, cold hands and feet, dead fingers, chilblains and true Raynaud's disease.

Is it not significant, too, that the disorders—urticaria, erythema, migraine, asthma, mucous colitis—to which rheumatic children are prone, occur with notable frequency in subthyroidic subjects? Still more that such often undergo attenuation or cure by thyroid therapy? But—it may be objected—are not these various affections often ascribed to protein sensitization and moreover prone to hereditary transmission? Admittedly so, and the same is perhaps secured by endocrine heredity. For there is some evidence that the protective mechanisms of the thyroid extend to anaphylaxis.

Thus, Mante tells of a woman—sensitized to eggs—who nevertheless could eat them with impunity when pregnant, and then only. Now, thyroid secretion increases during pregnancy, and Mante suggests that her tolerance of eggs during pregnancy, was due to this autothyroid therapy. Again, Levi and Rothschild note that the victims of migraine, urticaria, asthma, and allied affections often—during pregnancy or the menopause—enjoy immunity from these disorders. Moreover, having observed that many of the aforesaid syndromes respond favorably to thyroid, they are inclined—like Mante—to conclude that the freedom enjoyed is due to the enhanced thyroid secretion incidental to these periods. Lastly, Leon Kepinow found that if—after a protein injection—thyroid were given by the mouth a day or two prior to the secondary inoculation, it minimized or prevented anaphylactic shock.

Albeit, if rheumatic children show signs of hypothyroidism, they exhibit also from time to time signs indicative of hyperthyroidism. Thus, they are highly nervous, are prone to emotional outbursts, bouts of epigastric pain and diarrhea, sweatings, cardiac palpitations, and loss of weight; symptoms presumably resulting from the influence of the thyroid secretion on general metabolism and the adrenal sympathetic system.

We see then that though hypothyroidism may, so to speak, be dominant in rheumatic children, it is not exclusively so. For, as seen on a substrate of hypothyroidism symptoms of hyperthyroidism manifest themselves after a paroxysmal periodic fashion. The explanation presumably is that, given functional inadequacy of the thyroid with consequent endocrine imbalance, the defective gland will, from time to time, strive to correct the disequilibrium. This, as it were, by phases of reactive thyroid hypersecretion, the paroxysmal or periodical incidence of which is determined by similar fluctuations in activity of those factors or conditions tending to inhibit the gland's function and which primarily occasioned the underlying state of hypothyroidism.

Now, as previously observed in Graves's syndrome signs of hypothyroidism and hyperthyroidism may coexist, and I have recorded examples of such possibilities. Moreover, at this juncture when the victim, so to speak, oscillates between the two conditions, cautious thyroid therapy, presumably by stabilization of endocrine equilibrium, has proved beneficial. This renders more intelligible the good effects of thyroid therapy in cases of rheumatic fever refractory to salicylates.

In like fashion in these subthyroidic rheumatic children, tentative thyroid administration often lessens or dissipates their tendency to periodical phases of hyperthyroidism. This, as is revealed by their proneness to disorders of paroxysmal incidence, e. g., tetany, migraine, dead fingers, Raynaud's phenomena, etc.

Would it not be wise, therefore, by way of prophylaxis:

1. Carefully to scan children of rheumatic stock for minor signs of hypothyroidism or more cor-

rectly of hypohyperthyroidism, or thyroid instability.

2. To scan with equal care their parents for signs of hypothyroidism, noting also any tendency to goitre or exophthalmic goitre, either in themselves or other members of their family.

3. In case of refractoriness to salicylates, to suspect thyroid deficiency, and cautiously to invoke, in addition, thyroid therapy.

4. In obstinate or relapsing cases—if residing in a goitrous region—consider removal to a nongoitrous locality.

The predilection displayed by rheumatic children for disorders that are paroxysmal and periodical, is striking. So ingrained, too, is this pathological habit that, when later they present definitely rheumatic manifestations, these also tend to recur in cycles, phases of relative immunity alternating with phases of hypersensibility, the outward reflection of the incessant combat between the rheumatic virus, whatever its nature and the defensive endocrine mechanisms of the organism.

(*To be continued*)

Protein Shock in the Treatment of Rheumatoid Arthritis

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SPECIFIC AND NONSPECIFIC IMMUNITY

Within recent years a good deal of attention has been directed to a method of treatment known familiarly as protein shock therapy. It has been applied in an experimental manner to the treatment of a great variety of diseased conditions, and even yet its proper value is not fully determined. Among the diseases which have responded more or less successfully to this method of treatment is rheumatoid arthritis, and for this reason the subject is here referred to.

The difficulty—indeed the impossibility—of producing a specific immunity to any infection in the absence of certain knowledge as to the infective agent has long been a great barrier to progress in our treatment of disease by vaccines and similar means. Failure to find a means of increasing the specific immunity naturally turned attention to the possibility of exploiting the nonspecific defensive mechanisms of the body. Certain nonspecific antibodies (in the broad sense of the term) were known to exist in normal individuals, and the idea of increasing the potency of these was obvious. It was known also that the parenteral injection of foreign proteins and similar substances leads to a marked physiological reaction, and this fact was made the basis of various attempts at nonspecific immunization and incidentally conferred on the reaction the name protein shock.

THE PROTEIN SHOCK REACTION

So many factors are involved in the reaction to the injection of foreign protein and other substances of the kind that the actual nature of the reaction is difficult to determine. The more the phenomenon has been studied the more complex has it been found to be. It would be unwise at the present time, therefore, to make any dogmatic statements as to the true nature of protein shock or to attempt to define its relation to either specific immunity or anaphylaxis. Suffice it to say that, so far as our present knowledge goes, such relationships do exist, and that the reaction cannot be fully explained in terms of specific immunity alone.

The actual details of the shock reaction vary considerably according to the nature of the agent employed, the dose, the general health of the subject, and other similar factors. Typically, however, the main features of the reaction are as follows. A short time after the injection has been made all the clinical symptoms of a chill appear. The patient feels ill, and after a preliminary sensation of coldness which may amount to an actual rigor, the temperature rises sharply, reaching its maximum usually within four or five hours, and then falls. Synchronously with the rise in temperature there is an increase in the pulse rate, in the number of leucocytes in the peripheral circulation, and in the blood pressure. These return to normal more or less in sympathy with the temperature curve. As soon as the febrile reaction is established profuse sweating begins and there may be some reduction of blood pressure. A variety of other symptoms may be produced such as headache, nausea, vomiting and nervous excitement. The spleen is sometimes definitely enlarged, and albuminuria is occasionally met with. Apart from these clinical symptoms a number of changes may occur which require special methods for their demonstration. Among these may be mentioned certain changes in the enzymes of the serum to which attention has been drawn by several writers. Petersen, whose monograph on *Protein Therapy and Nonspecific Resistance* contains a detailed account of the whole subject, found that the serum protease, after a preliminary diminution, shows an increase for a period of several days after the reaction. Serum peptidase and ereptase are also increased, and it is suggested that this increased enzyme activity is an important part of the detoxicating mechanism of the body.

A great many substances have been used by various workers as antigens in the production of protein shock. Originally typhoid vaccines were used, and indeed it was during their use in attempts at specific treatment of typhoid infections that many of the earlier observations on nonspecific immunity were made. Mention may be made of other bacterial vaccines, split bacterial vaccines, normal serum, milk, various proteins and their cleavage products such as peptone, enzymes and leucocyte extracts, colloidal metals, such as gold, manganese and silver. The two substances of which I have personal experience are typhoid vaccine and peptone, and the use of these will be described in detail.

TECHNIC OF TREATMENT WITH PROTEIN SHOCK

Intravenous method.—Intravenous injections of Bacillus typhosus vaccine have been used on a considerable scale for the production of protein shock. One reason for the choice of this particular vaccine is the association already referred to between the vaccine treatment of typhoid infections and the early observations on protein shock, as a result of which there accumulated clinical experience of the effects of this antigen. Another reason for its use may be the ease with which antityphoid vaccines are prepared and sterilized. Apart from these considerations there is no reason for using this particular organism. I have noted, however, that in a series of cases in which a Bacillus typhosus vaccine was used, severe herpes of the lips and mouth resulted as a complication, and I was able to trace this to the presence of a particular strain of the bacillus in the mixed typhoid vaccine employed. It would appear, therefore, to be advisable to adhere to a vaccine prepared from strains of Bacillus typhosus which have been tried out and have been found to be suitable for this form of treatment.

The dose of the vaccine may be varied according to the degree of shock desired. To begin with it is well not to exceed one hundred million bacilli, but if the resulting reaction is not sufficiently well marked, the dose may be increased to one hundred and fifty or two hundred millions on subsequent occasions. It is recommended that the vaccine should be diluted with approximately five c. c. of warm (body temperature) normal saline immediately before use, but this does not appear to be essential. The dilution of the vaccine certainly allows of more accurate measurement in a syringe. The actual injection is made with a fine intravenous needle fitted to a small serum syringe, and the most convenient site is usually one of the antecupital veins. The injection should be made slowly, with of course the usual precautions as to asepsis, and as a preliminary to the treatment it is advisable to have the bowels freely moved. Within half an hour or less the reaction should be evident, but its intensity and duration vary with the dose and with the state of the patient. During the reaction the diet should be restricted to fluids and the patient should be kept warm and protected from chill. There is sometimes a good deal of local disturbance in the affected joints but this need give rise to no alarm. After the reaction has subsided there is generally a certain amount of malaise and headache, but these soon clear up, and patients often state that they feel particularly well a day or two after a protein shock.

It is important not to allow too long an interval to elapse between the reactions lest a negative phase develop. Too large a dose of antigen should also be avoided. Either of these may lead to a lowering instead of an increase in the patient's resistance. While the interval between the shocks may be varied according to circumstances, it should be about five to seven days. The total number of doses given depends largely on the degree of improvement which follows in the joints—and also, one may add, upon the docility of the patient!

Intramuscular method.—There are certain obvious objections to the use of the intravenous method of producing the protein shock reaction, and I have found the intramuscular method quite satisfactory. The substance which I have used has been peptone, and the amount given has varied from 0.3 to 0.6 grams. As much as one gram may be required, however. Peptone may be bought from most of the commercial drug houses made up in solution for the treatment of asthma, and the particular preparation which I have used has been a 7.5 per cent. solution prepared by Martindale. This is quite a convenient strength, as five c. c. of the solution is equivalent to 0.325 grams of the solid peptone.

The peptone solution may be prepared, however, by anyone who has the means of sterilizing it. Bacteriological peptone is mixed with normal saline in a mortar and the solution is made up to such a bulk that the strength is equivalent to five or ten per cent. This solution is filtered twice through fine filter paper and distributed among a number of small vaccine bottles or tubes. It is then sterilized by heating to 75° C. to 80° C. for thirty minutes on three successive days. This peptone solution is injected with a fine needle into one of the large-bellied muscles such as the gluteus maximus. One may mention the advisability of withdrawing the piston of the syringe slightly after the needle has entered the muscle so as to make certain, from the absence of any reflux of blood, that the needle is actually in the muscle and not in a bloodvessel. The reaction should be well established within half an hour of the injection.

While it is well to commence with a small dose of 0.3 or 0.4 grams of peptone, the amount may be increased considerably on subsequent occasions. The aim should be to produce a rise of temperature to about 101° F., and there does not seem to be any particular advantage in exceeding this. The number of injections and the length of the intervals between them again depend upon the circumstances of the case. As a general rule one may say that four or five injections at intervals of about a week will be found to be satisfactory.

EFFECTS OF PROTEIN SHOCK IN ARTHRITIS

What then is the value of this protein shock therapy in rheumatoid arthritis? There seems no doubt that in a proportion of cases at least the treatment is followed by definite clinical improvement, but even its most enthusiastic advocates do not claim that the method is to be regarded as a cure. It is generally agreed that other therapeutic measures should be carried out in conjunction with this special treatment. By thus combining ordinary treatment with protein shock it appears to be possible to accelerate recovery of movement in the affected joints in some cases, and in a few cases at least to arrest the disease. Whether such improvements in symptoms or arrest of the disease will prove to be permanent it is too soon to say, but many observers report very encouraging results. It should not be forgotten that since the aim of the treatment is simply to increase the defensive mechanism of the body, it is futile to look for the disappearance of old standing lesions associated with marked structural changes. Lastly, it should be remembered that protein shock therapy has not emerged fully from the experimental stages, and that its use, encouraging though the results appear to be, must be tried out on a much larger scale than has been done hitherto, before its true value can be ascertained.

SUMMARY

1. The intravenous or intramuscular injection of certain foreign substances, particularly proteins and their cleavage products, leads to a marked physiological reaction to which the name protein shock is applied.

2. Since the protein shock reaction results in an increase in the activity of certain parts of the defensive mechanism of the body, it has been introduced as a means of increasing nonspecific immunity in the treatment of infections of obscure origin such as rheumatoid arthritis.

3. The technic of protein shock therapy is discussed and a detailed description is given of, *a*, intravenous treatment with typhoid vaccine, and *b*, intramuscular treatment with peptone.

4. The clinical value and the limitations of the treatment are discussed, and it is concluded that while protein shock therapy has a certain value in the treatment of rheumatoid arthritis—particularly in accelerating clinical improvement—it augments rather than replaces the older methods of treatment. It must be borne in mind that protein therapy is still in the experimental stage.

The Course of Rheumatic Heart Disease

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The other day I was glancing in desultory fashion at the pages of Watson's *Lectures on the Principles and Practice of Physic*—a delightful book that was in its time the best English textbook of medicine—when my eye lighted on a discussion of the nature and causation of Sydenham's chorea (1). What fixed my attention and induced in my mind a faint sense of humiliation was a remark to the effect that Todd and Begbie, men who were shining lights in the constellation of British medicine in the early Victorian days, had both of them propounded the view that carditis, polyarthritis and chorea were the varying expressions—varying only because they emanate from organs varying in structure and function—of the human body's response to the rheumatic virus. This is the view that most British physicians hold nowadays, but I confess that it was with a mild surprise that I found that it dated from the days of Warburton Begbie and Todd. Perhaps we have advanced a stage or two beyond it; perhaps the truer view is that expressed by Sir Norman Moore in his *Lumleian Lectures* (2), that the carditis is the central fact, with chorea, polyarthritis and so on, for its complications. This balance of alternatives is so much a matter of words and terms that it is hardly worthy of further consideration except in so far as it serves to make clear the sense in which the term rheumatic heart disease, which appears at the head of this paper, is used by me. We are here speaking of an infective disease of the heart, which is likely to coincide with lesions of brain, joints and subcutaneous tissues, very definite in type and playing out its part in strict conformity with certain rules.

Its onset is traceable nearly always to childhood, and adolescence. In about two thirds of over six hundred cases observed by myself, the patient was between the ages of five and fifteen at the time of onset. This is the age at which the body is teaching itself the lessons of immunization against the bacteria by which it is infested. The presence of cardiac disease is first noted under one of four sets of circumstances. The doctor is asked to treat the patient for rheumatic pains or chorea, and looks for and finds signs of carditis: that is the first and largest group. The second group, which is large in proportion to the care which the practitioner concerned is in the habit of devoting to the examination of his patients, consists of children, who, having been noticed to lose flesh and color, or to be wanting in appetite and energy, are found to entertain an active cardiac rheumatism. In the third group attention is first drawn to the presence of a cardiac lesion by symptoms of cardiac inefficiency, dyspnea in particular. Many of these patients have already passed into adult life and in many of these, as in the fourth group—a group of those in whom the signs of cardiac disease are first noted in the course of a general examination such as that of the insurance offices—after inquiry made, the occurrence of some slight rheumatic illness during childhood is recollected.

But, for each and every one of these groups the cardiac lesion may be truly described as rheumatic if it conforms to the rheumatic type, even if there is not the least evidence that the patient has ever had rheumatism or chorea. Often a diagnosis of rheumatic heart disease made on this basis is vindicated by the subsequent appearance of chorea, polyarthritis or subcutaneous nodes; but even when this is not so the diagnosis of cardiac rheumatism is nevertheless to be adhered to if the disease follows the lines of evolution which are characteristic of the rheumatic type of heart disease. In the same way as we are now accustomed to diagnose pulmonary tuberculosis on the general aspect of the case without slavish respect to the results of sputum examination, so also we ought to learn to diagnose cardiac rheumatism without waiting for other rheumatic phenomena.

Now, if we are to follow this principle we must have a clear mental picture of the morbid process by which the lesions of rheumatic heart disease are established. The first basic fact is that it is a pancarditis. All parts of the heart are injured; the myocardium, especially that of the left ventricle, and the mitral valve are always attacked, the pericardium more often than not, the aortic valve in about half, and the tricuspid valve in about a quarter of all cases. The microorganism responsible, a small diplostreptococcus derived in all probability from the alimentary tract, gains access to the cardiac tissues by way of the coronary circulation, so that the lesions which it establishes begin within and about the myocardial

arteries and capillaries (the Aschoff body being one phase of these lesions) and in the subendothelial parts of the valves and pericardium. The myocardial and endothelial cells are attacked by the toxins thus liberated, suffering injuries which vary widely with the amount of the dose of poison inflicted on the heart. These acute changes pass off, if and when the activity of the invasive process dies down, but permanent results remain in the shape of subendothelial and perivascular fibrosis, vascular occlusions, loss of endothelium and deterioration in the quality of the myocardial cells. Each recrudescence of activity adds its quota to all these lesions. Their severity varies widely in degree. At one end of the scale is the case of the child who dies within a few days of the onset because the capacity of the cardiac muscle to do its work has been suddenly destroyed by an overwhelming dose of poison. At the other end is that of the person whose heart has been so quietly and subtly attacked by a long series of minimal doses of infection, that not until adult life is reached are any symptoms or signs of cardiac inefficiency detected. In the former, the clinical picture is that of acute dilatation with ventricular failure; in the latter, that of chronic mitral stenosis. Between these lie every shade of severity, every conceivable combination of acute and chronic lesion, every kind of pancardial damage.

Now, a followup of over six hundred cases of rheumatic heart disease, the results of which have been fully published in a book on *Rheumatic Heart Disease* (3), recently published, disclosed certain facts. First, the average age at death in this clinical series, as well as in a series of cases examined post mortem at the Bristol General Hospital, was twenty-eight years. Second, there was in each of these series only one year between the ages of seven and fifty which failed to claim a single victim. Thirdly, in both series over thirty per cent. of the fatalities occurred during the second decade of life; that is to say, taking the average age of onset as ten, it is the first decade after onset that is the deadliest. The reason for this is not difficult to perceive, for it is during the first years of infection that the infective process is most active. The more rheumatic microorganisms there are in the heart tissues at any one moment, or within a given time, the more likely is the heart to be defeated. This simple, yet farreaching principle of prognosis, is strikingly illustrated by facts relative to the influence which the kind of onset has on the duration of life in rheumatic heart disease. Of those rheumatic children who are first seen by reason of chorea, only one in thirty dies of heart disease in the first decade. Of those whose first symptoms are articular, one fifth die in the first decade; of those who are first seen for the carditis itself, over a quarter; and of those who have subcutaneous nodes at the first visit, fifty per cent. fail to survive for ten years. What is the meaning of this? It is very simple. It takes a minimum dose of infection to cause chorea, the brain being so sensitive an indicator of infection, and a maximum dose to cause so gross a reaction as a palpable node in the subcutaneous tissues; while the heart and the joints lie between these extremes. In other words, the prognosis is worse in those patients who show signs of systemic saturation with the rheumatic infection, just as we have already seen it to be worse in proportion to the degree of saturation of the cardiac tissues by that infection. An interesting aspect of this latter fact is to be found in the gravity which the detection of pericardial friction lends to the prognosis of a case of rheumatic carditis. Children whose signs of cardiac rheumatism include those of pericarditis do worse than the others—a generalization to which, I suppose, every physician of experience would agree—not because there is anything essentially or intrinsically lethal about an inflamed pericardium, but because it is only when the heart is infected through and through that the pericardium is inflamed. The more organisms there are in the wall of the heart, the likelier are they to penetrate into the pericardial sac and there to arouse a reaction that can be detected clinically.

We must be content with this brief summary of some of the evidence in support of the view that since cardiac rheumatism is the result of saturation of the tissues of the whole heart by the rheumatic cocci, the greater the degree of that saturation the more rapid the progress of the disease. We have next to glance at another equally obvious deduction. If it is the whole heart that is attacked by this infection, the muscular lesions will matter most because the muscular functions are the chief functions of the heart, the purpose for which it exists and for the furtherance of which all its parts are adapted.

The most obvious exemplification of this truth is to be found in the fact already stated, that it is the first decade of the infection that is the deadliest. Deaths at this period are of the kind associated with acute dilatation of the heart, that is to say with acute ventricular failure; and this in turn is but an expression of ventricular infection. That this is so is proved by the constancy with which the characteristic inflammatory foci are found in the ventricular walls, and by the absence—at this stage—of any lesions other than muscular lesions, that could conceivably cause a fatal decline in the contractile power of the heart. How could such a catastrophe possibly result from swelling and fibrosis of the valves or from fibrinous exudation in the pericardial sac causing its obliteration? Such lesions as these must not only be themselves extreme in degree in order to bring about the failure of an organ, the amplitude of whose reserve force is proverbial; they must also have been established long enough to have depreciated the value of the muscle cells. Now, neither of these conditions has been satisfied in the first decade after infection, and it is therefore to the muscular lesions that we must turn if we are to account for the high mortality of that decade.

It must be admitted that if we turn to the other end of the chapter, to those decades to which the "lucky" patients survive, we come upon a state of affairs in which the part played by direct action of the virus on the cardiac muscle is not so obvious. The clinical picture that we find here is that of a patient with the signs of mitral obstruction to which have been added the phenomena of auricular failure. There is little in this to suggest that active infection of the heart has done the mischief. But indeed, it is a fact that this failure of the auricle is not usually a direct result of infective damage to its muscle. Twelve hearts from patients with rheumatic heart

disease and auricular fibrillation were submitted by me to a thorough examination, including serial sections of the sinuauricular node, and many sections of other blocks from various parts of the auricular walls, and in only one of these was there evidence of an acute inflammatory basis for the auricular failure. In the remainder the changes in the auricular walls were obviously degenerative, due presumably to long continued overstrain on the one hand, and coronary stasis on the other, both of them the result of the narrowing with obstruction at the mitral orifice that is so constant a feature of the survival phase of cardiac rheumatism. This auricular failure, then, that is so often seen in the last years of the cardio-rheumatic life, is due only indirectly to inflammatory processes, yet the patients who survive the onset of that failure longest are those whose hearts are least affected in other ways; in particular those who have least enlargement of the ventricles. It is not surprising that this should be the case. The chief menace to life implied in failure of the auricular functions lies in its influence on the work of the ventricles. The rapid irregular stimulation of the ventricles, that is the cardinal feature of auricular failure, spells ruin to the ventricular efficiency, since it reduces the diastolic rest of the heart to a dangerously small fraction of the normal. If the walls of the ventricles are already carrying on with difficulty, this further burden of rapid irregular stimulation will be unendurable, and failure must ensue. Now, lesions of the ventricular muscle in cardiac rheumatism are in the main due to the direct action of the rheumatic infection on that muscle. Ventricular muscle that was gravely injured in the first decade of the disease will, at the end of the second decade, be less able to endure the extra strain put on it by auricular failure than that which has suffered less severely. Once more, therefore, we come back to the conclusion that the lesions of the cardiac muscle that are directly traceable to active infection, are more hurtful to cardiac efficiency than any other of the component factors of rheumatic heart disease.

There is another aspect of the survival phase of cardiac rheumatism that is worthy of comment. Often mitral stenosis is looked upon as the result of an endocarditis which happened once for all in childhood and started a fibrosis which progressed thereafter by its own momentum. That this does not represent the whole truth is proved by three facts. First, the more carefully we watch our patients with mitral stenosis, the more likely we are to find brief periods of fever and other signs of infective activity. Second, autopsy shows that even where no such signs are present in life, evidences of active inflammation of the mitral cusps can often be seen with the naked eye. Third, mitral cusps that present no such naked eye changes can be shown by the use of the microscope to be the seat of an active inflammatory reaction. That valvular fibrosis which plays so large a part in bringing about breakdown in the last phases of cardiac rheumatism is itself the outcome of an active inflammatory process which is in all probability due to persistent or often repeated infection of the valvular tissues.

I submit, then, that the course of rheumatic heart disease is, from start to finish, that of an infective process. In this respect it is comparable to the course of such diseases as pulmonary tuberculosis or cerebrospinal syphilis. Experience has taught us that our hope of abolishing these diseases lies chiefly in prevention. Treatment may retard and even arrest their progress, but it cannot make the injured tissues whole again. What is true of these diseases, is true also of rheumatic heart disease. If we are to save humanity from the distress and waste which this disease inflicts, it must be by a policy of prevention, directed and informed by a knowledge, clearer and more accurate than that which we possess at present, of the causal microorganism and the conditions under which it flourishes.

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Arthritis and Infection of the Digestive Tract

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This communication is based upon an analysis of two hundred cases personally investigated from many different walks of life. Gout, venereal or tuberculous disease of the joints, and all cases of monarthritis have been excluded, but no other selection has been exercised, and with these exceptions the cases may be regarded as consecutive.

Areas of infection in the alimentary tract are often multiple and can be divided roughly into an upper zone which includes the mouth and throat, and a lower one which comprises the bowel and its appendages. In the present series, active sepsis was present in the throat and nose in thirty-four per cent. of the cases, and around the teeth in fifty-two per cent., while infective streptococci were recovered from the feces of eighty-four per cent. The great importance of the lower zone has been shown clearly by Sir Arbuthnot Lane and is well demonstrated by the two following cases:

CASE I.—In this instance absolute cure followed the removal of the infected colon, although areas of chronic infection in the tonsils were left untreated. M. H., a woman of twenty-eight, had suffered from severe constipation since infancy and from rheumatic arthritis for fifteen years. All her joints were affected. Her colon was removed in 1913 and liquid paraffin taken as a routine measure afterwards. No other treatment of any kind was employed. She became free from pain after a few days and has never had any more pain or swelling in her joints

up to the present date. She has gained four and a half stone in weight, can bathe in the sea with impunity, and leads an active life with a normal feeling of vigorous wellbeing.

Case II.—This patient's arthritis was cured by colectomy although he had pyorrhea alveolaris which was left untreated. H. M., a boy of thirteen, had been constipated for many years and had had rheumatoid arthritis for fifteen months affecting knees, ankles, elbows and jaw. There were pyorrhea pockets between the gums and teeth and radiograms showed involvement of the periodontal membrane. Colectomy was performed and the pain left his joints. During the next few months a flexion contracture of the elbow straightened itself without any manipulations, and now, five years later, he is a well-developed young man following a laborious occupation and with no trace of his former joint trouble.

COMPARISON OF FORMS OF INFECTION

Although much infection takes place from the tonsils and jaws, invasion from the bowel is of a much more serious nature. Chronic arthritis often commences many years after the extraction of all the teeth. This had occurred in fifteen per cent. of the present cases, the period which had elapsed between the extractions and the onset of arthritis varying from two to twenty years and the average time being eleven years. In these patients invasion of the joints must have taken place from some other mucosal focus. Another sixteen per cent. had had total extractions done during the course of the arthritis and yet continued to have outbursts of arthritis with the involvement of fresh joints. Almost all the extractions had been done for gross septic conditions. Critical analysis of the throat histories shows a similar state of affairs. Four per cent. of the patients had had their tonsils enucleated many years before the onset of arthritis, and another five per cent. had received no benefit from enucleation carried out during the course of the disease. The remaining ninety-one per cent. still possessed their tonsils. If this inquiry is taken one step further it is easy to find patients with continued arthritis who are both edentulous and devoid of tonsillar tissue. The explanation of the failure in the treatment of these patients lies in the infection which was taking place from the lower zones in the bowel and which had been neglected after the cleansing of the mouth.

INFECTIONS OF THE BOWEL

The lower zones of infection can be divided into two anatomical groups. In the first group are localized infections. Mechanical agents, such as hard feces, obstructions, stasis, ptosis, and distention with gas produce loci of depressed resistance through attrition, local poisoning of the mucosa, and interference with the flow of blood and lymph. In these places infective bacteria establish areas of chronic infection in the wall of the bowel. Stercoral ulcers, diverticulitis, ulcerated piles, cholecystitis and chronic appendicitis are common examples of this type of infection. In the second group there is a diffuse infection which sometimes involves the whole intestine from duodenum to rectum, and may or may not be associated with circumscribed zones of special activity such as have been placed in the first group.

Most of the infections are streptococcal, but a few, four per cent. in the present series, are staphylococcal.

Staphylococcal infections.—The two following cases are typical examples:

Case III.—D. W., a boy aged five, had suffered from constipation since birth and from Still's disease for two years. His hips, knees, ankles, wrists and elbows were seriously involved. He had much intermittent pyrexia with rigors. Blood cultures yielded a pure growth of Staphylococcus citreus. Cultures taken from his ileum during a laparotomy also gave a growth of the same organism.

Case IV.—F. P., a woman of twenty-seven, had for three years suffered from rheumatoid arthritis of the fingers, wrists, knees, and spine. Stasis occurred in her ileum and colon. At laparotomy her mesenteric glands were seen to be acutely enlarged. Cultures from them gave a pure growth of Staphylococcus aureus and similar organisms were obtained from the contents of the ileum.

RATIO OF STREPTOCOCCUS LONGUS TO BACILLUS COLI

Site	*Averages of 21 serial analyses*	*Averages of all analyses*
Duodenum	100.0	100.0
Jejunum	100.0	100.0
Upper ileum	80.20	83.17
Lowest ileum	46.54	41.59
Cecum	24.76	18.82
Pelvic colon and feces	3.97	14.86

Streptococcal infections.—In this widely distributed group are included infections by many different types of streptococcus, and only six per cent. of the present series were hemolytic. In about one third of the cases abnormal forms of the colon bacillus of the nonlactose fermenting or late lactose fermenting varieties were found in association with the cocci. In the diffuse infections the streptococci are distributed along the alimentary tract in a definite pattern. In the pelvic colon they are much less numerous than the colon bacillus. In the ileocecal region they become more conspicuous and at the higher levels are usually present in pure culture. This distribution is illustrated in the table. In the second column are given the averages of analyses carried out on twenty-one patients from each of whom serial cultures were made at several levels at laparotomy. The pattern was the same in each of the twenty-one cases. In the third column are given the averages of analyses made on a much larger number of patients, including many cases in which an analysis was made at one level only. The same pattern can be seen in each series. Streptococci predominate in the small bowel and the colon bacillus in the large bowel. The precise level at which transition takes place from streptococcus to Bacillus coli dominance varies in different patients, because of variations in the chemical nature of the contents of the bowel determined by differences in diet, peristalsis, and ferment efficiency. The point of transition is usually in the ileocecal region, but may be on either side of the ileocecal valve.

MORBID CONDITIONS UNDERLYING THESE INFECTIONS

Chronic infections do not arise in the normal alimentary tract. Derangements, often of severe degree, were traced in more than ninety per cent. of the present series.

Stagnation is almost universal. Three quarters of the patients had suffered from constipation for many years prior to the onset of arthritis and in almost half of these cases the constipation had been severe. As measured by means of an opaque meal and x rays stasis was found as commonly in the small bowel as in the large. In the colon it occurred in eighty-nine per cent. of cases, the average time taken for the evacuation of the greater part of the meal in these cases being more than three days, while in some instances a week was required. In the ileum stasis was found in ninety per cent. of cases. In these the average time required for the ileum to empty, after all the barium had left the stomach, was eight hours, whereas under normal circumstances only three and a half or four hours are needed. Stasis was not so common in the stomach and only occurred in one third of the cases. The average time taken for the meal to pass through the stomach was eight hours, or twice the normal time. In many of the patients repeated overloading of the colon during a period of years had led to compensatory hypertrophy with elongation. Three quarters of the patients had long redundant loops of pelvic colon and in two thirds the transverse colon was doubled in length and hung in a tortuous festoon across the abdomen. In many patients there had developed secondary obstructions which aggravated the primary stasis. One half of them had a kink in the last coil of ileum. One third had a very acute splenic flexure in the erect posture and as many as ninety per cent. had a last kink in the pelvic colon. The appendix was examined at all laparotomies and whenever the opaque meal entered and displayed its shadow on the fluorescent screen it was abnormal in three quarters of these cases. Sometimes it was the seat of chronic inflammation, but more frequently it was fixed to the posterior abdominal wall and acted mechanically by interfering with the passage of the food through the last coil of ileum.

Ptosis had occurred with great frequency to the hindrance of peristalsis and the free flow of blood and lymph. For the purposes of this description only outstanding examples in which the ptosis was so severe as to be beyond all dispute have been noted. In fifty-one cases the greater curvature of the stomach was within an inch of the symphysis pubis in the erect posture, in 133 cases the cecum was deep in the pelvis. In an equal number the hepatic flexure was in the right iliac fossa and in about the same proportion of cases the transverse colon fell to the level of the symphysis pubis.

Ferment action was commonly defective and digestion slow, so that much unassimilated food found its way into the large bowel where it formed a suitable nidus for bacterial activity. The production of an excess of gas affords the most direct evidence of such activity and 130 of the patients complained of this undue flatus in the colon. A similar proportion complained of gastric symptoms which were of many different kinds and varied in severity from heartburn and nausea to vomiting and acute epigastric pain after meals. As a group these symptoms indicate the great frequency with which errors of digestion in the stomach and duodenum occur in arthritic patients.

Apart from bacteriological analyses much direct evidence of infection of the colon was forthcoming. Intermittent looseness of the bowels, short attacks of severe diarrhea, and the repeated passage of mucus were of common occurrence, while in a small minority of cases persistent diarrhea replaced the more usual constipation. A history of one or other of those varieties of diarrhea was given by sixty-seven per cent. of the patients.

In certain cases there were extensive lesions of other kinds in the alimentary tract. Chronic gastric ulcers were seen in seventeen per cent. of those cases upon whom high laparotomies were performed and histories of recent severe hematemesis were given by two per cent. of the other patients. Gallstones were found in eleven per cent. of high laparotomies and typical histories of gallstone colic were given by three per cent. of the remaining patients.

MASKED STASIS AND HIDDEN SEPSIS

Study of this series has shown again and again that stasis and sepsis can exist in the intestine and yet not be manifest without investigation. The bowels may act every day in spite of serious delay in the colon. The residues from the meals of the preceding twenty-four hours are not evacuated, but are stored up by such patients and passed out at the forty-eighth or seventy-second hour, as the case may be. The colon always contains the accumulated débris of two or three days' meals. In other cases the latent stasis is in the ileum, where the food may be retained for twice the normal time before it is passed into the cecum. Such a delay does not of necessity interfere with the regularity of defecation or give rise to discomfort in the abdomen. Masked stasis of these types is at once brought to light by systematic radiography, but cannot be detected readily in any other way. Sepsis in the bowel is just as frequently masked. Even extensive invasion of the bowel by infective bacteria such as streptococci does not always produce diarrhea or any other sign of irritation. The true nature of these cases can only be detected by serological tests and the examination of cultures of the stools. Serious streptococcal infection of the ileocecal region sometimes occurs even when the flora of the feces appears to be normal. Such cases have frequently been investigated at laparotomy when samples of chyme could be obtained from the small intestine. In other cases they can be detected by giving the patient an ounce of lactose, a dram of magnesium sulphate, and the juice of a lemon in water before breakfast on three consecutive mornings and examining the stools which are passed on the third day. The lactose reaches the colon and promotes the growth of streptococci which are hurried onwards so rapidly by the magnesium sulphate that they can be recovered from the stools.

In brief, it can be stated that stasis often occurs in the colon although there is a daily evacuation; stasis often occurs in the ileum, even when the patient does not refer any symptoms to the alimentary tract; streptococcal infections are often present in the bowel, although there are no symptoms of irritation of the colon, and extensive infection of the ileocecal region does not always lead to the excretion of living streptococci in the feces.

RESULTS OF TREATMENT

The condition of the alimentary tract dominates the outlook in rheumatoid and osteoarthritis. The general scheme employed in the treatment of the present series of cases has been as follows: The entire alimentary tract was surveyed carefully in each case and an estimate formed of the relative degrees of septic absorption occurring at the various levels. The more accessible areas of infection in the jaws, throat, and intestines were treated surgically and all the disorders of the digestive tract which had encouraged the development of chronic infection were dealt with. Autogenous vaccines proved of great value when used to supplement these measures. They were prepared from infective bacteria of all the principal zones of sepsis. Streptococci obtained from different foci in the same patient usually vary in their cultural characters, and each strain was included in the vaccine. Chronic infection frequently damages the thyroid gland. In the present series minor forms of subthyroidism were common, while well defined myxedema or goitres of considerable size were seen in fourteen per cent. of cases. There is intimate association between immunity reactions and the functions of the thyroid gland. The dry extract of the thyroid was given in all such cases with great benefit to the joints. Accurate diagnosis aided by radiography and bacteriology, makes radical treatment and cure possible. In the present series of cases, which have been followed for varying periods up to nine years, eighty-nine per cent. show great improvement or complete arrest. Of the failures one quarter had received very partial treatment only and could not be inoculated with vaccines. If it were possible to exclude those cases in which circumstances such as age, temperament and position in life prevented the full use of radical methods the results would have been still more encouraging.

Diet in Rheumatism

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We are sometimes asked, "Does meat, especially red meat, cause rheumatism?" If we considered the question in the sense generally intended by the inquirer, our answer would be "No." The nitrogenous foods taken in moderation are useful; when taken in excess, they putrify and cause the intestinal toxemia which produces baneful effects on the whole system. A properly balanced diet is our most important safeguard against various diseases of which one is rheumatism. So far as possible, variety should be unrestricted, balance carefully preserved, and quantity distinctly limited.

The directions generally given as to diet in acute rheumatism are simple, brief, and perhaps, narrow. We are told by many to give milk, farinaceous foods and suitable drinks. "Nothing but milk should be given until the temperature has been below 99° for twenty-four hours" (Latham, England). "Only milk and farinaceous food" (Friedenwald, United States).

We are told by Einhorn that in former times, and up to seventy-five years ago, the teaching of Hippocrates prevailed; and the custom was to withhold nourishment (including milk) from those having any form of continued fever, and give them only weak tea, barley water, and similar substances up to the time of convalescence.

Then came the great physician, Graves, who said the starvation method was wrong, and used instead nourishing food, especially milk in large quantities. Before long Graves's views were generally accepted.

To a considerable extent, at least, we agree as to the value of milk; but we differ regarding some details. It is frequently, if not usually, termed "a liquid food which is easily digested." Soon after it reaches the stomach, however, it becomes a solid food which is more or less difficult of digestion. Chalmers Watson of Edinburgh tells us a solid curd is formed in the stomach by the ferment rennin and the acid of the gastric juice. There is also a process termed clotting, which he says must be distinguished from curdling. The clot consists of the solidified casein with fat entangled in its meshes. This clot becomes "more tough and less easily digested" than the curd lump. "In enfeebled states of the digestive apparatus a hard indigestible mass forms which proves an irritant to the whole intestinal canal, and sometimes is recognizable unchanged in the feces."

Rheumatic fever has two serious aspects beyond all other fevers. It produces profound anemia, and also, as a frequent sequel, organic disease of the heart. We should guard against these in our treatment, especially dietetic and medicinal. There is no other form of fever in which a carefully selected diet is more important, and yet there is none in which the directions generally given are so meagre.

Milk is an excellent food in both health and sickness, but as an exclusive diet suits very few, if any. I know a couple between the ages of forty and fifty, both strong and healthy; the husband loves milk and can take four glasses a day with comfort, the wife hates it and a half glass causes discomfort. Would you try to compel this woman to drink two quarts of milk a day if she contracted rheumatic fever? But take two persons not so far apart, each having a limited capacity for milk. With such it is often difficult to decide as to amounts which should be prescribed. When you give solid food, say bread and butter, a man may stop eating when hunger has ceased, but when you give liquid milk, thirst may be the predominant factor, and the patient cannot tell when he has taken enough for the food needs of the body.

We have also to consider changed conditions in disease, especially in the digestive apparatus. Supposing one can take and digest three or four pints

of milk a day when well, we do not know that he can assimilate that amount when sick.

Another feature may now be considered. We are not asked to discuss medical treatment, but we cannot altogether ignore it. If any medicine produces ill effects, it may compel us to modify our dietary. For instance, sodium salicylate reduces temperature and relieves pain in rheumatic fever, and for these reasons is administered, but we find that its effects are in some respects noxious. It invades important nerve centres, causes ringing in the ears with sometimes deafness, and disorders of vision; irritates the kidneys, vitiates the blood, has a bad effect on the heart, nearly always nauseates, and not infrequently puts the stomach quite out of commission.

Osler expressed the opinion that the salicyl compounds relieved pain, but did not influence the duration of the disease or prevent cardiac complications. Relapses are more frequent than in any other method of treatment. I quite agree with Osler, and have administered no salicylates for thirty years. It is only fair to state, however, that many do not concur. Burney Yeo, as good if not a better therapeutist than Osler, believed the "treatment by salicylates has proved more efficacious than any other."

It appears to me that the pain reducers in rheumatism which interfere least with digestion are chloral and morphine, especially in combination.

Yeo strongly recommended the milk diet: three to four pints in twenty-four hours with large amount of water, lemonade, etc., making altogether one hundred and fifty ounces of liquid a day. When milk disagreed he gave whey.

A vegetarian diet has been recommended, but it is of little use for building up, and is worth little or nothing for the anemia and weak heart of rheumatism. Milk is the best food for infants and young children. To a less extent it suits the aged. In the House of Industry, Toronto, old people are occasionally given milk alone for limited periods. The inmates, knowing this, usually ask for the milk when they get off color, and get it as long as they want it. They enjoy it and derive much benefit, but grow tired of it in six or seven days, and then, at their own request, return to their ordinary diet. When I first learned this years ago I thought it odd that all or nearly all should want the exclusive diet for the same definite time—six or seven days. I have also noticed that in the continued fevers, especially rheumatic, patients who took milk willingly in the first week grew tired of it in the second.

After graduating I for some years prescribed the exclusive milk diet in typhoid and rheumatic fevers and also in the toxemia of pregnancy. After careful observation I acquired the opinion that milk was not always easily digestible, that its influence for good in these diseases was either slight or nonexistent.

As mentioned before, variety, quantity and balance are important in all diets but especially in that for inflammatory rheumatism. Milk contains a greater variety of nutriment than any other food or class of foods. Within proper limits it is serviceable; excess may make it harmful. Cream, butter, cheese, junket, etc., may be considered by themselves. As to limitations, we should name one to two instead of three to four pints as the maximum a day. As to substitutes, we rely mainly on buttermilk or occasionally some of the artificially soured milks. We have discarded whey because it has very little nutrient value on account of the removal of the fat and casein. As to ordinary beverages, one could name a score or more. Let the patient choose for himself as far as possible.

From milk we turn to starchy foods, without trying, however, to disassociate these from other sorts. We want to make as much variety as possible. We have to consider, for instance, bread and milk, bread and butter, with perhaps jam or cooked fruits, mixtures of barley water and other cereal waters with milk; combinations of porridge, boiled rice, and simple puddings, etc., with milk. When ringing in the changes we can easily run up into the hundreds. If some of them are solid or semisolid, no harm. They are generally quite as palatable and digestible as milk even when diluted, often more so.

There is not much to say about vegetables, although they are, of course, an important element in our ordinary food supply. Most of them may be used, especially in the later stages of rheumatism. We may consider the potato a vegetable, and we have only to say that it is easy of digestion and a good food. There is no reason why it should not have its place in a rheumatism dietary. Of other vegetables we find that many are rather coarse fibred, and, being bulky, are apt to cause indigestion, or rather seriously affect a digestion already to some extent disordered.

Fruits mostly cooked may be used to a considerable extent. Among those may be mentioned baked apples, apple sauce, peaches placed in boiling water with the skins on, and nearly all sorts of preserves, jams, and similar substances. Almost the only fruit recommended in the raw state is the grape, rejecting, of course, the skin and pips.

There is considerable objection to the use of meats, and without any extended discussion I shall simply give my own views. Meat extracts and broths may be given at any stage, and after six or seven days if not earlier small quantities of roast, broiled, or boiled meats of any sort may be given with safety, but, in order to keep out of the danger zone only small quantities should be given, and at only one meal of the day.

In rare cases alcohol may be useful as a food where there is hyperpyrexia and the patient is greatly exhausted. In saying this we are referring to it only as a food. Its virtue in these cases lies in the fact that it is absorbed rapidly. Because of its speedy action we employ it sometimes in serious cases of emergency which arise in the various fevers. During such a crisis a little alcohol may be given, and perhaps the best sort available for the purpose is ordinary whiskey, but we have to remember that alcohol is a poison, and little of it goes a long way in that direction when the vital powers are at a low ebb. It is difficult to state a definite amount, but we should say that not more than half an ounce of whiskey added to four ounces of water should be given at any one time, and as the patient is sipping this small amount the effect should be carefully watched. But when giving alcohol as food keep

in mind its potency as a medicine. When there is serious heart weakness stimulation may soon give place to depression.

In health one may enjoy a meal of roast mutton, potatoes, cabbage and custard pie. But if it were repeated for five successive days one might ask for a change. With a digestive machinery thrown out of gear the rheumatic patient does not want any food very much, but would like changes, and probably lots of them. With hundreds of sorts at hand surely you can give him variety.

Restriction brings greater difficulties which require careful consideration and good judgment. Aim at giving sufficient for hunger without causing satiety. If the patient has no hunger and refuses all solid or semisolid food give him plenty of water in some form—a little weak tea if you like. Small quantities of barley water, oatmeal water, toast water may be tried occasionally. If, in case of extreme anorexia, you decide to try milk endeavor to prevent the formation of the curd lump or the fat-casein clot: dilute well say one part milk to two of the diluent which may be plain water, or soda potash, seltzer or salutaries. This means milk one in three while the dilution before recommended was half and half. In many cases with a rebellious stomach plain water (say a gallon in twenty-four hours) may be taken readily, if not greedily, with satisfactory results.

Do not make any list of avoids. There is no food which when used correctly will produce rheumatism. But, one may ask, would you recommend roast goose, pickled cabbage, mushrooms, Brazil nuts, etc.? Probably not, but no one can say that any of them would be always harmful. It would be better probably to select foods in their order of digestibility so far as you can judge, and your list will be so long that you are not likely to reach the goose or cabbage in forty or twice forty days. Therefore do not waste much time in deciding on the foods to prohibit, but always avoid anything in the way of food that has previously disagreed whether before or during the illness. Among the most frequent of these are perhaps, eggs, strawberries, roast veal, tomatoes, and cheese, but there are many others.

Balance, always complex, becomes more so as we increase variety. The following dietary will indicate to some extent the lines we should follow. It is necessarily incomplete, and should be changed and enlarged as considered advisable by doctor and nurse. Increase the number of foods for the different meals if you like, but select carefully for each meal, change from day to day, but measure carefully. For the first two weeks especially too much is worse than too little.

BREAKFAST 7 TO 8 O'CLOCK

Water; one glass of diluted milk; cereal, wheat, oats, corn or barley (three to four ounces or half a small helping) and milk, or bread or toast and butter with cooked fruit or jam, a small cup of coffee or a half cup of orange juice, or half grape fruit. As at all meals give patient water first, as much as he cares to drink, then the milk. If he prefers not to drink the full glass of milk, let him take only as much as he likes. If he drinks the full glass, and would like another at the close of the meal, give it to him. But never urge him to take at any meal more than he wishes, whether it be an ounce, a gill or a pint. We also think no milk should be given between meals. The stomach gets no real rest—not even partial relaxation—when milk is taken every two hours.

LUNCHEON 11 TO 12 O'CLOCK

Water; glass diluted milk, vegetable soup, four ounces, or meat broth, four ounces, or meat jelly, one teaspoonful, half a small helping of spinach or two stalks of asparagus, or milk toast, or half artichoke, or carrot or turnip, or parsnip or baked apple or stewed rhubarb or soft boiled or poached egg (half to begin with).

DINNER 4 TO 5 O'CLOCK

Water; glass diluted milk or buttermilk, or bread and milk (six ounces milk and half slice stale bread); meat broth three to four ounces or vegetable soup three to four ounces, or butcher's meat, or chicken, or fish; beets or squash, or cooked tomatoes; boiled rice and milk tapioca or bread pudding, with milk and a little sugar if desired.

Give the soup or broth at one of these meals (luncheon and dinner) and the meat or fish at the other.

SUPPER OR FOURTH MEAL 7 TO 8 O'CLOCK

Water; milk or bread and butter, or corn cake, or oat cake, or graham gem, or zwieback, or wheat rusk or abernethy cookie; maple syrup, or preserved or cooked fruit, or honey.

Four meals in the day are recommended only in exceptional cases and for limited periods, the fourth to be discontinued as soon as possible.

This dietary may be to some extent misleading partly because it is intended to cover all stages of rheumatism from acute to chronic. To prevent misunderstanding, the following is recommended for the first week of acute inflammatory rheumatism.

FIRST WEEK

First meal—Water; diluted milk, barley water, or rice water, or oatmeal water.

Second meal.—Water, bread and milk, or bread and butter, or meat broth.

Third meal.—Water, diluted milk or buttermilk, tapioca or sago or bread pudding, or milk toast.

Give water at the commencement of every meal, and at any other time during the twenty-four hours up to two to three quarts.

It is hoped the water at the meals will quench the thirst, while the milk and cereal water will satisfy the hunger.

After the water give a full glass of the diluted milk or as much of it as he wants. At the close of the meal give a second glass if it is desired. Aim at giving up to one to two pints a day, but never in any case more than he desires.

During the first and second weeks Nature indicates through increased thirst that the body needs more than the usual amount of water, and through decreased hunger that the digestive system can utilize comparatively little food for the time being, whether liquid, semisolid or solid.

Historical Medicine

Herodicus and His Hygiene as Viewed by Hippocrates and Plato

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The aspirations of this title are more accentuated in alliteration than in any hopes I have of making head against the wild exaggerations of college athleticism. I hope, however, there can be worked into the story, in the place of much moralizing, accounts not totally devoid of interest and suggestion.

The confusion about Herodicus and Prodicus is a small embarrassment in the history of Hellenic medicine over which most if not all commentators have stumbled ever since Galen. It is a small thing but it is so perplexing it is almost amusing. On the whole there is little instruction to be derived from the personal side of it except the small light it throws on Galen as the source of our knowledge of ancient medicine. In the works of Plato and of Hippocrates themselves there is no question at all who is Herodicus and who Prodicus. The Herodicus of *The Republic* is "the inferior sort of a doctor," a keeper of a sanitarium of some sort, a trainer of athletes, himself dragging out a miserable existence as a valetudinarian. Before the time of Herodicus the guild of Æsculapius, according to Plato, did not practise our present system of medicine but one "which may be said to educate diseases, but Herodicus was a trainer," etc. In the Hippocratic Corpus he is a practitioner who destroys his fever patients with gymnastics.

AN UNKNOWN PUGILIST
Rome, National Museum

In the *Protagoras* he is spoken of as "now of Selymbria and formerly of Megara." In the *Phædrus* Herodicus is spoken of as recommending his patients to walk to Megara and back, seventy miles, but in the *Gorgias* there is an Herodicus, a physician, spoken of as the brother of Gorgias of Leontinum in Sicily. It is difficult to identify this Herodicus with the Herodicus "of Selymbria," which was in Thrace, "formerly of Megara, 210 stadia northwest of Athens," but not impossible. The brother of Gorgias may have come to Megara or Athens and then gone to Selymbria in Thrace. Such peregrinations were ascribed to Hippocrates II, "him of Cos."

The *VI Epidemics* of Hippocrates, it is agreed by Galen, Littré and Adams, was written by a son or son in law of the Great Hippocrates, but this opinion seems based on the mention of an Herodicus who gave his fever patients too much gymnastics. They identify this Herodicus, as I have intimated, with the Herodicus attacked by Plato for exercise theories and for his folly in keeping chronic sick people alive by a regimen of diet.

Now let us turn to Pliny, the elder. There is no Herodicus mentioned by him, at least none noted in the careful and copious index of Silleck, but there is a Prodicus mentioned as being born at Selymbria, a disciple of Hippocrates, using medicines by inunction, who invented diet in the treatment of disease. It is difficult not to see in this Prodicus of Pliny, who wrote in the first century A.D., the Herodicus and not the Prodicus of Plato's dialogues. It seems probably we owe to Soranus whose chronology is uncertain, the statement that Prodicus was an instructor of Hippocrates. He is the author of a life of Hippocrates, a fragment of which we have. He probably wrote after Pliny and very possibly much later. This may have been a mistake or he may have been both a pupil of Hippocrates and one who interested him in gymnastics as an aid to treatment. We struggle along thus far eluding difficulties with difficult hypotheses, but when we reach Galen our entanglements thicken. He calls this Herodicus, as Pliny does, Prodicus, but he knew it was not in accord with the text of Plato. He says, with a singular blindness to the question, it is of no consequence whether we call him Prodicus or Herodicus. It is to be presumed that elsewhere he is speaking of the same person when he says Prodicus wrote a book on Medicine or Nature. "Plato exhibits profusely the inventions attributed to this man," a saying which makes us suspect he confounds him with Prodicus of Ceos, sophist and philosopher. Galen quotes from the medical author the advocacy of the use of milk in phthisis and mentions his opinion on the subject of phlegm. It is Prodicus he names in the *Methodi Medendi* and his commentary on the *Aliment* by Hippocrates but it is Herodicus he mentions in the same connection as to a milk diet as in the *Methodi Medendi* in another book, *De Macore*. So it is evidently the same person.

In order that we may see it does make a great deal

of difference in the history of medicine whether the person is called Herodicus or Prodicus, in connection with a personage of the Platonic dialogue, it is well to be reminded how famous was the Prodicus in them.

Prodicus of Ceos was a teacher of the youth in Athens, a philosopher who had Socrates as a pupil, though in one of his discourses the latter says he was too poor to pay him the fifty drachmæ which was his price for instruction. Aristophanes introduced him in some of his dramas, though he is not so severe on him as on Socrates. This Prodicus, the great philosopher, the celebrated sophist, too was not robust and something of an invalid, but in Plato's dialogues he is very differently and much more often mentioned than Herodicus. It was quite natural for Pliny or a copyist of Pliny to write or to mistake the first two letters in the names and thus originate the error and confuse the record for a casual reader, but it is not speaking well for Galen's assiduity as a student of Plato that, quite aware of some confusion of names having arisen, he should not have untangled the snarl. It seems probable that Galen was led into error by this passage in Pliny, who wrote a hundred years or so earlier, but we can only guess at the cause of Galen's confusion and suspect him of carelessness in recording the sayings of his predecessors—a rather serious matter in one who is not only our most copious, but often our only, source of information as to ancient medicine. If one who wrote books on the theories of Hippocrates and Plato was too negligent to straighten out a thing of this kind ("no matter whether his name was Prodicus or Herodicus") we may easily believe our grasp on his predecessors whose works have perished is very slight indeed.

It was not the sickly Prodicus then, who, Xenophon says, wrote so eloquently of Hercules, it was the invalid Herodicus who trained athletes with his diet as well as chronic invalids and made people with acute fevers practise gymnastics to their detriment. Apropos of him we learn what both Plato and Hippocrates thought of athleticism in an age when it was carried to greater exaggeration than even in our own times. In this at least they are rightly quoted by Galen, who gives them his support after being an official physician of gladiators in Pergamum. Athletes, Plato says in the *Republic,* sleep away their lives and are liable to most dangerous illnesses if they depart, in ever so slight a degree, from their usual regimen. This I believe is borne out by our modern trainers and, though it has been disputed, breakdown of the vascular system in middle life is much more frequent among those who have long and persistently followed violent forms of athleticism in youth, but Plato was thinking of athletes as warriors in his Republic. The highly trained "flanneled fools," in Kipling's severe remarks on the same subject, did not stand up well in the ancient training of the soldier. Plato wanted warrior athletes to be "like wakeful dogs both to see and to hear with the utmost keenness; they will have to endure many changes of water and also of food, of summer heat and winter cold and with this they must not be liable to break down in health." Then Socrates, who himself had been such a hardy and brave campaigner in his younger days, expatiates for some time on simplicity in diet and temperance in all things. Simple food and moderate exercise make the best warriors for his model state. Licentiousness, Corinthian girls and drunkenness in the guardians of his republic can not be tolerated. "Of all men these should know where the ground is," the police of his state and the chauffeurs of ours as well.

One of the first of the *Aphorisms* of Hippocrates (I.3.) deals with athletes in the same spirit as the sentiment of Plato. It is not improbable that Plato's ideas were formed on it. Through some mutilation of the text, doubtless, the latter phrases of this aphorism are marred by an obscurity which neither Galen nor Littré have done much to dispel, but these apparently refer to the treatment of the disastrous results sometimes observed in the training of athletes. The opening clauses state emphatically the Hippocratic feeling on the matter much as Plato has here been quoted. Singular to say Adams in his translation uses a French word which the Frenchman Littré does not select and it changes the meaning of the opening clause considerably, whether we are to say *embonpoint* or *santé,* carried to the limit, is dangerous.

Since man never stands still and since he can not advance he deteriorates. The reference of course is to that training or overtraining which allows Nature no way for the variations which are an inevitable characteristic of living things. Adams thinks Herodicus gave Hippocrates instruction in the training of athletes, but if he did, this is very much in the way of an acute criticism on it from which the only escape is to make it a dispute about the meaning of the word.

Treatment of Infants.—Institutions for infant care developed very late in Paris. After institutions for children and orphans had existed for several centuries in many cities of France and the rest of Europe, it was not until the fourteenth century that there was established in Paris a special institution for receiving infants. We learn from Dr. Renoux (*Thèse de Paris,* 1924) that it still remains unique after almost two hundred years.

The Hôpital du Saint-Esprit was founded April 9, 1364, "by many good people moved with a great pity, charity and compassion." At one and the same time crèche, asylum, orphanage, even hospital, Saint-Esprit sheltered at least from one to two hundred children. There were also in Paris other institutions where children could be received at least temporarily with their mothers. Such was the Hôtel-Dieu, one of the "most sumptuous of Christian institutions." There were always in this hospital a great number of infants at the breast. From eighty to a hundred at least were received each year. In all the hospitals the mortality was frightful. King Francis I was so distressed by it that he ordered an investigation into the cause and the remedy. Five years later he established the Hôpital des Enfants Dieu, called Enfants Rouge because of the color of the uniforms worn by these orphans. This institution completed the Saint-Esprit; it was the first indication of the great flood of charitable works that was to sweep through the sixteenth century.—(Translated from *Æsculape,* February, 1925.)

Contributors to the Science of Medicine

Christian Albert Theodor Billroth

In modern times it is rarely indeed that we find a happy and successful combination, in the person of one individual, of the musical and scientific temperaments. In the Middle Ages such persons were not so scarce, but today is the day of the specialist. Theodor Billroth, born in 1829, was an exception to this rule. He was a learned and accomplished musician, and at the same time one of the most successful surgeons of his time.

Billroth's birthplace was Bergen, on the beautiful Island of Rügen. His family life and early surroundings were of the happiest and most highly cultured. At an early age he gave evidence of a love and real talent for music, which he always insisted were hereditary. His grandmother had been a well known soprano at the Berlin Opera House and his wife's grandfather was the famous tenor Eunicke who created the rôle of Florestan in Berlin. Had he had his way as a boy, he would have dedicated his life to music, but his mother prevented him from doing so, a procedure for which he seems later to have been grateful.

Theodor, after completing the courses at the gymnasium, went to the universities of Greifswald, Göttingen, and Berlin, in the last of which he received in 1852 his degree in medicine. The title of his thesis was *Concerning the Nature and Causes of a Pulmonary Affection Arising from Section of the Vagus.* It was considered at that time to be a contribution of unusual merit and of great promise. Among the famous men under whom Billroth studied were Rudolf Wagner, Müller, Lotze, Schönheim, and von Graefe. He did notable work not only in his specialty, surgery, but also in normal and pathological histology, physiology, and general pathology. After postgraduate courses at the universities of Vienna and Paris, he was appointed assistant to Langenbeck at the Royal Clinic at Berlin University, where he became a brilliant operator. Among other prominent positions which he held were those of Privat-Docent at Berlin University and chief professor and director of clinical surgery at Zurich University.

His first great published work, *General Surgical Pathology and Therapeutics,* achieved, as soon as it was issued, the most notable success, and was subsequently translated into Italian, Spanish, Hungarian, Polish, Russian, Servian, Croatian and Japanese.

Like all exceptionally great men, Billroth had to combat much antagonism and opposition on the part of his own profession. When, at the height of his fame and in the full flower of his activity, he accepted the chair of surgery at Vienna, and attempted to introduce some of his own progressive methods and ideas with a view to reorganizing the clinic in accordance with the most advanced standards of medical science, he aroused a veritable storm of opposition. However, through the sincerity and charm of his personality, and the employment of tact and patience, he finally succeeded in overcoming the greater part of the antagonism and in estimating many of his own ideas and practices. Here, as everywhere, he came to be greatly loved and admired by all who came in contact with him. His handsome face and figure, charm and brilliancy of manner, and unquestionable genuineness and sincerity, coupled with his fluency of speech and freedom from all doctrinal tenets attracted and gained for him the friendship of many persons in all walks of life. Ideas quite new to his pupils were developed and pathological phenomena as they appeared at the sick bed were explained in the light of the latest discoveries in physiology, pathological anatomy and experimental pathology. "The soul of science breathed life into his teachings; the love of truth, with which Billroth was completely saturated, made them real," writes Dr. Hammeter in his biographical sketch of the great German physician.[1]

Probably the greatest contribution of Billroth to medical science was in the domain of practical surgery. During the Franco-Prussian War he was a military surgeon and his letters written from the military hospitals where he served are remarkable and invaluable documents. Upon his return from the field hospitals, he resumed his investigations of the vegetative forms of septic cocci, on which he wrote one of his most famous monographs. At this time he frequently would work from sixteen to eighteen hours a day. After the completion of this investigation and the monograph on its results, Billroth with characteristic energy and versatility began a study of the arrangement and character of courses in medicine in the universities of all countries. The results of this investigation are recorded in his book, *How to Teach and Study the Medical Sciences.* This is still a veritable treasure house of information and ideas. Among his other works were monographs and treatises on wounds, scrofula, tuberculosis, diseases of the mammary gland, historical and critical studies of transportation of the sick and wounded, home and hospital nursing, and other medical topics. Even up to his last illness, Billroth always retained his keen interest in and knowledge of medical science, so that his information was never out of date. One of his unusual contributions was a fine collection of illustrations of rare diseases made under his direction by the celebrated artists of that time. Billroth performed the first successful extirpation of the larynx, and the first resection of the stomach.

The great physician had, too, a remarkable degree the ability to adapt himself to many varying types of personality, even those that differed widely from himself. He had also the gift of inspiring his pupils and of handing down his work through them to posterity. Because of his great love of music, he trained himself to be an able performer on several instruments, and was recognized as a musical critic of marked ability. He was also an artist in his tastes, as was shown by his beautiful Villa Billroth. Here

[1]Johns Hopkins Hospital Bulletin, Vol. XI., 1900, p. 297.

he and his wife, Christel Michaelis, would receive their many friends from prominent Viennese families; yet these were made no more welcome than the poor students from the universities who were taking Billroth's courses. Perhaps because it was the principal musical centre of the day, Vienna became the chosen and beloved city of the great scientist. He endowed many of her charitable institutions, among them the Rudolfiner Association with its hospital at Oberdöbling, and the building of the Royal and Imperial Society of Physicians in Vienna. When he died, the government assigned to him a grave of honor, and a throng of thousands of mourners followed the funeral cortege through the streets.

In musical circles Billroth was known not only for his masterly performances on the piano, violin, and viola, but also for his many musical criticisms published in the papers and journals, and for his book, *Who Is Musical?* In this he attempts to clear up the entire subject of physical and physiological acoustics, and to blend and relate to each other the esthetic aspects of music and its physical and physiological aspects. He conceived of music as standing in a much closer relation to pure sensation than any of the other arts, which deal rather with what the senses apprehend.

Dr. Hammeter sums up as follows Billroth's contribution to the world: "He was a man who represents one of the most scholarly, versatile and inspiring characters in the history of German medicine; an investigator who accomplished and perfected achievements of enduring excellence in two arts widely divergent—music and surgery; or, to state it in broader terms, in biology and medicine as well as in the psychology of music."

The Contributions Which Women Have Made to Medical Literature.—Metta M. Loomis, librarian of the College of Medicine of the University of Illinois, writes (*Medical Woman's Journal,* December, 1924) that the first woman known to have written on medical subjects is honored by the commendation of no less an authority than Galen, who advises those who would learn of midwifery to consult the writings of one Cleopatra. A knowledge of the works of Aspasia, who wrote on the diseases of women, would also have been lost to the world except for references and quotations which were made in certain manuscripts dating back to the sixth century B. C. St. Hildegarde of Bingen wrote a book, *Physia,* which ranked with the best medical writings of her age, the twelfth century. It showed that its author was thoroughly familiar with the practice of medicine of her day. At the University of Salerno several professorships were held by women who also wrote on medical subjects. The most famous of these seems to have been Trotti, called Dame Trot, who wrote a book on gynecology which circulated beyond her own country. A textbook on surgery and another on gynecology were written by two other women professors and were used as textbooks for many years by medical students. Mondino received valuable help from his assistant, Alexandria Galiani, while he was writing his great work on anatomy.

After this early period of achievement, we find no women contributing to medical literature until the middle of the eighteenth and the beginning of the nineteenth century, when German and French midwives wrote books that ranked as authorities until the science of bacteriology revolutionized the practice of gynecology and obstetrics. Madame La Chapelle's *Practice of Obstetrics* is a work in three volumes which appeared from 1821-25, and was translated into German. The numerous and valuable tables of statistics compiled from her fifty thousand cases show remarkable pains in the keeping of case records and served to establish the norm for obstetric procedure at that time. Madame La Chapelle states that she consulted all authorities beginning with Hippocrates.

Madame Bovin, for a short time associated with Madame La Chapelle, was a more prolific writer and her works are equally worthy of note. Her best known book on *The Art of Obstetrics* was published in 1812 and was commended by the General Council of the administration of the Paris city hospitals. Others of her books are *One of the Most Frequent and Least Known Causes of Abortion;* and her work on diseases of the uterus and its appendages was used as a text book for many years. The University of Marburg conferred upon her the honorary title of Doctor of Medicine. Louise Bourgeoise was another of the noted French midwives, but her writings are less valuable from a scientific than from a literary and historical standpoint.

In Germany were Justine Siegmundin, court midwife, and Elizabeth Hornburg, midwife to Marie de Medici. The former's book is called *The Midwives of the Royal Family of Prussia and of the Kurfurst von Brandenburg.*

The modern activities of women in connection with the practice of medicine began in the United States about the middle of the last century when the Blackwell sisters entered upon the study of medicine. It was not until two decades later that women began to study medicine in England and Russia, and fifteen years later that the movement reached France, Germany and Scandinavia. The first American woman to contribute papers which really added to the general knowledge of medical science was probably Dr. Mary Putnam Jacobi, whose works on abdominal hysterectomy and uterine fibroids were the results of original research. A book published in 1891 called *Woman's Work in America,* includes a list by Dr. Jacobi of 154 articles written by forty-one women in medicine. A history of the Woman's Medical College of Philadelphia lists 573 articles by graduates of the college prior to 1897. The first volume of the *Index Medicus* published in 1879 lists twenty-one articles by ten different women; eight of these were Americans and two French. In the 1912 *Index Medicus* are 616 entries of books and articles written by women, 459 in number. Of these articles, 261 were published in America, 108 in France, 61 in England, 53 in Germany, 6 in Russia, 4 in Italy, 6 in Belgium, 2 in Poland, 10 in Switzerland, 2 in Austria Hungary, 1 in Australia, and 1 in Manila. The greatest number contributed by any one woman was by Kol-Yakimova, a Russian, who wrote twelve different articles published in German, French and Russian.

Of modern names, France has the most illustrious, Madame Curie; Italy boasts Madame Montessori's

medical works. The writings of Florence Nightingale and Ellen Richards have probably contributed as much as any toward quickening the public conscience to a realization of its sanitary obligations.

The writer concludes her paper with a summary of the work of the most important of the presentday women writers on medical subjects. A bibliography completes the article.

The French Cantinière, Humble Forerunner of the Red Cross Nurse.—Norah Hill writes (*World's Health,* December, 1924) that many students of medical history will be surprised to learn that there were women caring for the wounded on the battlefield of Solferino. An old book, *Cantinières et vivandières françaises,* traces the whole history of the French cantinière from her earliest appearance to the end of the Franco-Prussian war. Two cantinières, this book tells, were decorated for bravery at the battle of Solferino. One, "young and beautiful," took a small cask of brandy, one of water, and a small roll of linen and went among the wounded as a Sister of Charity. She herself, wounded in the arm, refused to leave the field of battle and managed to drag a soldier, wounded in the thigh, to an ambulance by having him cling round her neck. Meeting a surgeon just afterward, she had her mutilated fingers amputated then and there. Later, her ring, torn by shot, was presented to the Emperor, who handed her the military medal in return.

However, the history of the cantinière began much farther back, for Tacitus mentions her as having been seen in the German armies, accompanying the soldiers, carrying food for them, dressing their wounds and exhorting them to bravery. The Gauls also often took their women and children with them when they made war; in fact, as is well known, this custom persisted through the Middle Ages, to such a degree that one French writer attributes the outbreak of plague in 1639, which almost destroyed the French army, to the hordes of women and children always around the camps. Many of these were women of illrepute, he states, but these are not to be confounded with the cantinières, who were usually wives of the soldiers.

The custom originated in the venerable custom of taking in washing. From washing the regimental linen, they passed to keeping the regimental canteen. "But the canteen of those days was not simply a vulgar eating house; it was a meeting place where the young recruit was welcomed and initiated, and where the veteran soldier refought his campaigns; it was a sort of infirmary where first aid, in the shape of cordials, was administered to the wounded. The cantinières, however, were not content to give first aid only in their canteens; during battles they went out under fire and picked up the wounded and afterwards helped the surgeons to dress their wounds. More than once they were themselves wounded; and more than once did an enemy shell destroy their provisions, their sole wealth, but that did not hinder them from giving drinks to the dying without hope of reward, or from tearing up their own linen in order to dress the soldiers' wounds."

In the stories of Napoleon's campaigns, frequent mention is made of the cantinières. During the passage of the Piava, a cantinière saw a soldier being carried away by the current, and threw herself into the river and saved him. For this she received from Napoleon a gold chain and crown, thus earning the honor of being the first cantinière to be decorated. (I regret to say, however, that the gift was engraved, not with her name, but with the name of the soldier whom she saved!)

The costume of the cantinière was a tall hat with plumes and a chin band, and a long cloak; she rode a horse among her brandy barrels and provisions. If her husband was promoted, sometimes she became "Madame la Générale," or "Madame la Baronne." The names of some of the cantinières that have been handed down in history are Cathérine Rohmer, Joséphine Trinquant, and Thérèse Jourdain.

In 1830 an official uniform was prescribed for them, but not officially provided, however. This consisted of regimental trousers, a short, full skirt of red braided with blue, a short coat with brass buttons, a little white apron, and a red képi or hat with a bunch of tricolor ribbons in it. The little brandy barrel, an indispensable part of the costume, was painted red, white and blue.

The Manor of Laennec.—Dr. De Backer and Dr. Larbaud write (*Æsculape,* February, 1925) that while they were spending a month in a vacation resort of Brittany near Douarnenez, close by Laennec's former estate, they were so struck with its beauty, and with the reverence in which the name of the great master is still held by the natives, that they felt they must record some of their sentiments. Their article is attractively illustrated with reproductions from pastel drawings. The whole scene as depicted by the two writers is marked by the simplicity and modesty which characterized Laennec himself and his life. The old manor house, dating from the middle of the seventeenth century, has kept all its beauty in the perfect simplicity of its lines. It is located in a large park containing beautiful old trees of many varieties, especially pines, and is screened by a high hedge. The writers, after giving a detailed description of the house, add: All this has the same beautiful simplicity as the Master himself. It was to this pretty nook that he came to recover from his work and from the fatigues of Paris. There he lived happily, a lover of the soil, a modest and frugal life. Agriculture interested him greatly, hunting passionately, and it was not unusual to see him going to church with his gun on his shoulder. On his walks through the woods and fields, he would meet the peasants, and give them advice about their health and the cultivation of their fields. The whole countryside knew him and adored him for his modesty and simplicity. The old people still are happy when their are telling naive stories about him, handed down from their fathers. And all is of his kindness and devotion. He was so adored by the peasants that they quarreled over the privilege of drawing his little carriage when he went to mass or chapel.

After his death at the age of only forty-six, he was buried in the Cemetery of Ploaré, overlooking the village of Douarnenez, with the sail studded bay on one side, and on the other a smiling valley with bouquets of trees and clusters of little houses. The whole cemetery is a garden, in which his simple grave stone marks a well tended grave.

Editorial Articles

THE MENACE OF RHEUMATIC DISEASES

To those diseases massed together under the name of rheumatic diseases may be ascribed a large proportion of the mortality and invalidism of civilized countries. Rheumatism in its various forms is essentially an industrial disease. It kills, cripples, and in other ways renders unfit for strenuous active labor a large part of the working population of all countries. In Great Britain, for instance, it has been stated on the authority of the Ministry of Health that nearly one sixth of the industrial invalidity of the country is due to diseases classed as rheumatic. Each year these diseases are costing the benefit societies nearly ten million dollars for sick benefit, and the nation over three million weeks of work. Half this loss, both of money and time, is due to chronic joint diseases. Similar statistics covering the entire country are not available for America, but from known figures it seems likely that this continent is not far behind the continent of Europe so far as the incidence of rheumatic diseases are concerned and that industrialism is as much hampered here as elsewhere by the havoc wrought by these maladies.

Moreover, and this is the most arresting feature of the situation, acute rheumatism is largely responsible for heart disease in young children from which they never really wholly recover and which is the cause of immense mortality. Heart disease in the young is known to be very prevalent in this country and therefore it may be taken as proved that acute rheumatism attacks children with deplorable frequency. Chronic heart disease throws a large burden of invalidism on a country which taken in conjunction with the cost in money and time lost due to rheumatic diseases mentioned above reaches a stupendous sum. If rheumatism can be prevented, even to some extent, the saving in death, suffering and money will be such as to be sufficient excuse for putting into force any measures which seem likely to further this object. Undoubtedly measures of this nature will be largely of a preventive character.

In the first place, what causes acute rheumatism? While this is not known definitely, the findings of the majority of observers are in favor of the view that tonsillar infection is an etiological factor which must not be overlooked. Clinical evidence shows that a considerable proportion of patients with acute rheumatism suffer from enlarged or septic tonsils. Dental sepsis appears to be associated so frequently with fibrositis in its various forms and with diseases distinguished mainly by chronic joint changes as to lend color to the view that if this condition does not produce these forms of rheumatism at least it predisposes to them. This question requires and is worthy of further careful investigation before definite statements can be made. But negative clinical evidence goes to show that a large percentage of rheumatic patients exhibit dental sepsis and oral sepsis in one form or other and that in those patients with chronic joint diseases the percentage is higher.

With respect to acute rheumatism it would no doubt simplify matters if we had more precise knowledge as to the causal organism. Lacking accurate knowledge there is one feature of acute rheumatism which is known and this knowledge should be acted upon. An attack of acute rheumatism confers no immunity but favors recurrence rather than immunity. Therefore, the primary object is to prevent a first attack and then to prevent subsequent attacks. Permanent damage is done to the heart more frequently by second and subsequent attacks than by a first attack. Attention may be directed to the point that although figures show that acute rheumatism has declined in incidence in this country and Great Britain, it appears likely that this decline is more evident in adults than in the young. The prevention of dental sepsis, and of enlarged tonsils and adenoids, falls perhaps chiefly within the sphere of medical school service.

The avoidance of nonarticular rheumatism is an industrial question of first importance, because muscular rheumatism, lumbago, sciatica and brachial neuritis are very frequent among workers, both men and women. The haziness which exists with regard to the causative organism of chronic joint diseases is more murky than that which obscures the causal organism of acute rheumatism, and consequently we are more at sea with regard to measures of prevention. To an unfortunate extent, we are groping more or less in the dark. We stand fairly in the light as to a few points. It is known that enlarged or septic tonsils predispose to rheumatism and the same may be said as to dental sepsis. Oral hygiene is therefore strongly indicated. Gastrointestinal troubles in themselves would appear to predispose to rheumatism and of course they react on the mouth and teeth. Consequently gastrointestinal disorders should be nipped in the bud as far as is possible and when established should be seriously dealt with. Diet and modes of eating should be supervised carefully and domestic hygiene, including the avoidance of dampness and chill, should be a part of the policy of prevention. In addition, however, the use of therapeutic measures should be initiated in many

cases and the gastrointestinal and urinary tracts should be subjected to disinfecting treatment. And it must be borne in mind that it is essential to cleanse the urinary tract, as the gastrointestinal tract becomes infected when the urinary tract is involved. In preventing and treating rheumatism, it is simply common sense to purify and keep clean to the utmost extent the digestive, intestinal, and urinary systems.

The menace of rheumatism mainly as an industrial disease is national, nay international, and every civilized country is intimately concerned. It is hoped that the symposium on rheumatism which we present in this issue may throw light on some features of a disease which has baffled investigators from time immemorial. It may be recalled that from the earliest periods, as shown by skeletons, man has been afflicted with osteoarthritis. In any event, this collection of articles should occasion renewed interest in a disease which is destructive and worldwide and, perhaps, may provoke discussion.

ENDOCRINES AND RHEUMATIC DISEASES

Life has its "little ironies" and medicine, too, is not devoid of them. Thus, is it not precisely those diseases with which we are most familiar that we know least about? Gout has been known to us for centuries, but its cause is still unknown. Rheumatic fever as far back as 1640 was recognized as a clinical entity, but its origin is still a mystery. Of the two, it is the latter that clamors most urgently for elucidation.

It is asserted that in the British Isles there are no fewer than fifty thousand children of school age who are the victims of organic heart disease. Again, the statistical bulletin of the Metropolitan Life Assurance Company, New York, states that about one in every five of the population living at the age of ten will ultimately succumb to organic heart disease. Clearly then, this problem of the rheumatic child is one of worldwide importance, and the call for the removal of such a menace is as insistent as ever it was for tuberculosis. Like the latter, it must be dealt with as a matter of public health. Hence the incumbency of a more judicial attitude on our part towards this intricate problem, one as far removed as possible from the influence of etiological suggestions with their aftermath, a restricted field of vision.

Convinced as many are of the infective origin of rheumatic fever, there is unquestionably another side, which calls for deliberate consideration. We can ill afford to leave any avenue unexplored. It is not a question simply of infection but of something vastly wider and more profound in a biochemical sense. For, as many maintain, if hypothyroidism is infinitely more common than is generally conceived, then we have to face the fact that a vast number of children start life crippled, in a metabolic sense, by their lack of thyroid hormones. Moreover, if we dwell for a moment on the farreaching cellular consequences of such thyroid famine, we see that the superficial minor signs of thyroid inadequacy are but the outward reflection of occult metabolic obliquities involving cellular metabolism as a whole. This being so, it may well be, as Llewellyn suggests, that the first stage of the rheumatic heart in a child may be purely metabolic, a failure in nutrition of the cardiac substance due to deficient or perverted thyroid hormones, and surely nothing could so favor a secondary implantation of wandering microbes. It is in truth the rheumatism of childhood that calls for intensive research, if we would eradicate this scourge.

Llewellyn's suggestion that rheumatism in childhood arises from a subthyroidic substrate, should, if confirmed, appeal to many, in that it opens up a possible avenue whereby this menace of childhood may be prevented, or its effects controlled or minimized. The nervous instability of rheumatic children is notorious, and their proneness to tetany and symptoms of vasomotor ataxia are distinctly suggestive of some inherited endocrine instability. That rheumatic fever occurring in the children of the actually goitrous, or those living in endemic areas, may prove obdurate to salicylates and yet respond if thyroid be superadded, may be not only a therapeutic boon but, as Llewellyn suggests, an etiological hint of profound significance. It raises the possibility not only that subthyroidism portends a greater liability to rheumatism, but also that its timely correction may haply stave off rheumatic fever or cardiac rheumatism. It clearly indicates that school officers must be quick to detect the minor signs of hypothyroidism in children. Especially in children coming of rheumatic stock should we be alive to the possibility of inherited thyroid deficiency or instability. Again, if the children live in goitrous districts iodine prophylaxis and the provision of a bacteriologically pure water supply are clearly of paramount importance, especially if it should transpire that the incidence of rheumatic diseases is markedly higher in goitrous as opposed to nongoitrous localities. For it seems certain from the observations of Berry and McCarrison that goitre is prone to develop in marshy, badly drained neighborhoods, with which rheumatism also has been from time immemorial associated.

Nor can we overlook the fact that not only rheumatism, but rheumatoid and osteoarthritic affections are apparently more common in goitrous districts. Thus, McCarrison states that in goitrous regions of

the Himalayas the prevalence of rheumatoid arthritis among the victims of goitre is such as to suggest a similarity of origin. That the osteoarthritis of women at or after the menopause is frequently associated with goitre or subthyroidism is generally admitted, and in short the evidence that rheumatoid arthritis and osteoarthritis are intimately associated with thyroid disorders is undeniable. The latter may take the form of Graves's disease, or states of hyperthyroidism or more often hypothyroidism, or actual myxedema frequently correlated with goitre. Moreover, the dramatic manner in which rheumatoid arthritis and osteoarthritis respond to thyroid therapy when given in suitable cases strongly suggests that thyroid inadequacy or instability favors their development. The fact that rheumatoid arthritis and scleroderma have followed thyroidectomy or exposure of the thyroid gland to x rays is highly suggestion of a causal nexus. Moreover, we have Deaver's recent statement that after partial thyroidectomy for goitre, especially the toxic variety, resistance is lowered to rheumatism and acute endocarditis.

Reverting now to rheumatic fever, French physicians have long insisted that subacute thyroiditis is commonly present at the onset or during the course of the disorder. That this fact should not have attracted more attention in other countries is somewhat astonishing. It may well be that this is due to the fact that not only is the thyroid swelling usually slight and fleeting in duration, but occasions no spontaneous pain. Despite absence of pain, however, the thyroid lobes are exquisitely tender if compressed digitally. It may well be then that routine palpation of the thyroid in rheumatic fever may reveal that such tenderness of the thyroid is present as Vincent claimed in sixty-eight per cent. of the cases. The thyroid swelling or tenderness usually responds to salicylates, and more swiftly than the joint swellings. On the other hand, it may persist, and the symptoms of hyperthyroidism or even Graves's disease be superadded.

In conclusion, we would plead for a more open mind in regard to the etiology of rheumatic and rheumatoid disorders. The following points seem worthy of further research. To begin with: Are rheumatic disorders generally more prevalent in goitrous than in nongoitrous areas? If so, has the installation of iodine prophylaxis been followed by diminution in their incidence? Do children of rheumatic stock commonly show signs of hypothyroidism? If so, timely thyroid therapy might diminish their liability to cardiac rheumatism. Research along such lines could not fail to be helpful, for unquestionably the etiological relationship of goitre to diseases other than Graves's syndrome, myxedema and cretinism urgent calls for investigation and research in the sphere of arthritic disorders.

HOLMES ON HYGIENE

The names of Osler and of Allbutt remind us, in their passing, of the few physicians who stand out as men of great culture or, rather, as men who have exhibited in their writings signs of distinction in general learning. None, however, have shown greater brilliance than our own Oliver Wendell Holmes, who sang in many keys and with lasting impression.

In this day of the writing of many popular or intended to be popular books on health, it will be interesting to many that Holmes also wrote, and in the most entertaining manner, on this subject. His definition of life contained in this essay is certainly as sensible as any: "Life is the state of an organized being in which it maintains, or is capable of maintaining, its structural integrity by the constant interchange of elements with the surrounding media." He remarks: "One would say that the regulation of the conditions of the body should be as simple as the ordering of the conditions which enable a skilful agriculturist to raise healthy vegetables and fruits. There are only two difficulties, we cannot choose our constitution and we cannot always command many of the circumstances which have most influence on health."

Speaking of vegetarians, he says: "It is easy to understand the repugnance with which fastidious persons regard the act of devouring the flesh of animals. The fanatics on the subject are sometimes terribly abusive, as I have had occasion to know. Yet I have had refreshing seasons of converse with vegetable feeders, who are commonly of a speculative turn of mind and amuse unbelievers with their curious fancies. Theories commonly go in sets like chamber furniture, and you will find a mind furnished throughout, physiologically, philosophically, morally, theologically, in the same shade of color, and with the same general pattern prevailing through all its articles of belief."

On the subject of drinks he writes: "Alcohol itself can hardly be said to be used as a drink at all, though the jars containing preparations, anatomical or other, in museums, are said to have sometimes lost their contents too rapidly for evaporation to account for. There is no need of dwelling on the ruinous effects of overindulgence in strong drink. Neither is there any use in telling lies, still less in legislating them. The habitual use of alcoholic fluids in the form of wine does not prevent men and women from living long, active, useful, healthy, and virtuous lives. Four of those whom I most honored in the

last generation drank wine daily all the years I knew them. Their age reached an average of between eighty-seven and eighty-eight years, and yet not one of them was of robust habit, or promised to attain any remarkable longevity.

"We cannot disguise the fact that men 'drink' because they like it, much more than for any good they suppose it does them, beyond such pleasure as it may afford; and this is precisely the point that all arguments fail to reach. Pleasure is the bird in the hand which foolish persons will always choose before the two birds in the bush which are to be the rewards of virtue. Intoxication offers to the weak or illmanaged brain a strange, pleasing confusion, a kind of Brahma's heaven, 'where naught is everything and everything is naught,' and where all perplexities at last resolve themselves into the generous formula, 'it's of no consequence.'"

All this was written a half century ago and, while there has been much legislation, the why and hygiene of alcoholic indulgence remain the same.

On the matter of clothing Holmes is especially happy. "The subject of clothing is understood well enough, and the rules of commonsense are well enough observed by men. But woman is under the guidance of a higher law than any relating to her individual safety. . . . It is in virtue of this supreme indifference to consequences,—this sublime contempt of disease and death as compared with the loss of the smallest personal advantage,—that woman has attained the power of resistance to exposure that so astonishes the male sex. Think of her thin shoes and stockings, her bare or scarcely protected neck and arms, her little rose leaf bonnet, by the side of the woolen socks, the layers of flannel and broadcloth, and the warm hats and caps of her effeminate companion! Our cautions are of no avail except to the fragile sex,—our brothers in susceptibility and danger."

PROGRESS IN THE TREATMENT OF ANKYLOSIS

Dr. J. B. Murphy of Chicago and Dr. Payr of Germany were among the first to operate for the improvement of a joint rendered immovable by bony ankylosis. Murphy, who was a remarkable surgeon, had a considerable amount of success with such operations and as a matter of fact his methods are used by many orthopedic surgeons of the present day. Progress, however, has been made in this direction, evidence of which is given in a paper read by Dr. W. Russell Macausland of Boston before a meeting of the Section of Surgery of the Massachusetts Medical Society, held at Swampscott, June 7, 1924, and published in the *Boston Medical and Surgical Journal,* October 6, 1924. The object of arthroplasty is that it is a surgical technic calculated to improve the function of an ankylosed joint, and therefore only those joints which can be improved by such a method are considered suitable for arthroplasty. These joints are the elbow, the hip, the knee, the temporomaxillary and the wrist and fingers. Other factors, as Macausland pointed out, must be taken into consideration before arthoplastic measures for the mobilization of any joint are advised.

The disability of the patient is of the first importance, for a stiff member that is a great disability to one patient may be of only slight discomfort to another. No attempt should be made to mobilize a joint until epiphyseal growth has ceased. If an operation is performed earlier it is impossible to remove sufficient bone to secure good motion with grave risk of injury to the epiphyseal line.

Macausland summarized the fundamental indications for arthroplasty as follows: 1. Two stiff hips indicate operation on one joint or possibly both; 2. Two stiff elbows present the same indication; 3. Two stiff knees are a definite indication for arthroplasty, on one side at least; 4. A combination of ankylosed hips and knees in the same individual, a condition not infrequently seen in multiple arthritis, is a very definite indication for attempting to mobilize one or more joints. Stiff shoulders, stiff fingers, stiff wrists and stiff maxillary joints may be dealt with also by arthroplasty. Aftertreatment is of the first importance as the ultimate success depends very largely on after treatment. Consequently, the patient should be under observation for a long period of time.

The bony changes of the joint should be followed by frequent radiograms and appropriate treatment when necessary should be performed in accordance with such changes. The knee joint is the most difficult of the joints to treat by arthroplasty and only the type due to intraarticular pathology is amenable to treatment. Owing to the fact that the new joint must be satisfactory not only as to function, but it must be absolutely adapted to weight-bearing that is free from pain and sensitiveness, the knee joints present very great, according to some orthopedists, almost insuperable difficulties, to the successful performance of arthroplastic methods. Macausland holds that two stiff knees or a stiff knee and a stiff hip, provide a definite indication for operation on one knee at least.

In the discussion that followed the reading of the paper Dr. N. Nathaniel Allison, of Boston, adversely criticized arthroplasty for knee ankylosis, stating that only an occasional success was obtained. He also gave it as his opinion that ankylosis is frequently

reestablished and explained why, and he did not think that arthroplasty should be represented as an easy or uniformly successful surgical procedure.

Dr. Macausland in replying to the criticisms on knee joint arthroplasty argued that when there were two stiff knees and hips and other combinations of ankylosis it was necessary to try something, and he and his colleagues could show a great many patients who had been treated for these and similar conditions, with decided improvement in function. He contended that one of the greatest objections to knee joint arthroplasties was instability and that instability had been due to improper modelling and after care, and this in most cases should have been avoided. There is no doubt that while arthroplasty is not a perfect operation and there is room for much improvement, considerable progress has been made. Dr. Macausland in this country, Putti in Italy and Hey Groves and Sir Robert Jones in Great Britain have been largely responsible for this advance.

AGAINST THE PRICKS

In medicine, curative and preventive, we are constantly kicking against the pricks, not only to no avail for the time being, but with the production of more harm than good.

It does not sound well for humanity to have an average number of days of absence from business on account of illness or average rates of sickness, whether the sick are engaged in business or not, but we are a long way from getting rid of illness, and even higher sickness rates might conduce to lowered death rates. This may sound paradoxical, but the fact is that it is the people who are not able to be about but who *are* about, who make best food for germs and premature candidates for the undertaker.

Especially does this apply to the matter of colds, whether these be "common," "influenzal," "bronchitic," or "pneumonic" or other. For the most of us there is not, at present, with all due hygiene, any long immunity to colds, and sooner or later they are bound to get us whether we do or don't "watch out." We might as well acknowledge this and take to our beds at their onset and stay there until we can safely leave them. A safe outcome will be more certain, and the immunity conferred for the nonce will be none the less.

It is a wise virtue to be ashamed of being sick and of lying up, but it is no virtue, nor is it at all valorous, not to acknowledge our lack of resistance to something to which, willy nilly, we have fallen a victim.

The outcome of colds (or what seem to be colds) would be made more certain, and their spread would be lessened if employers would make it plain that sick leave, equivalent to the present enforced absence for sickness (or even more) were assured to every employee.

The patient who believes he has "only a cold" and who seemingly has only a cold (though it is as likely, perhaps, to be influenza) is one of the most troublesome of patients. He invariably expects to receive a magic drug which will cure him instanter and allow him to return to work on the morrow. Even the recommendation of a hot bath, hot lemonade and an "early to bed" with plenty of blankets is secretly resented as trite and trifling, coming from a man who has studied medicine for a tenth of a lifetime. To insist that the man (or woman) with the cold stay in bed a day or two, or even remain in a room at one temperature for that length of time, may not conduce to attract the patient on another occasion, but it is the best practice and the only safe practice.

If the heads of big business, those who make their income out of human health, would be sufficiently considerate of human health to threaten it with dismissal if it does not keep itself in health, and should insist on paying it to take care of itself, such treatment of colds would be more appreciated, the working capacity would be heightened, and the deaths from respiratory diseases which now head the horrible list would be decidedly diminished. This would be more conducive to Karma in the great amassers of money than the financing of libraries or the building of hospitals, and the accumulation of money for the latter purposes would not be lessened.

Obituary.

SIR RICKMAN JOHN GODLEE, BART., K.C.V.O., M.B., M.S. (Lond.), F.R.C.S. (Eng.)

London

Sir Rickman John Godlee died suddenly on April 20th at his home a few miles from London. Godlee was a Quaker and a nephew of Lister. He graduated in arts at the University of London at the age of eighteen and entered University College Hospital as a medical student. He had a distinguished medical career and was a remarkably good anatomist and an extremely skillful draughtsman. So skillful a draughtsman was he that he was employed to make the original drawings for the plates of *Quain's Anatomy*. These drawings he presented to the Royal College of Surgeons in 1920. They are preserved in the library and comparison shows how infinitely superior they are to the plates made from them.

He became a member of the Royal College of Surgeons in 1872 and in 1876 took the fellowship. He also took the M.B. and M.S. of London University, being awarded the gold medal for surgery. He then went to Edinburgh, where Lister was a professor, to study his uncle's methods, and on returning

to London became surgical registrar at University College Hospital. There being no vacancy on the staff of University College Hospital at the time, he was elected assistant surgeon to Charing Cross Hospital and the Queen's Hospital for Children. In the following year he was elected assistant surgeon at University College Hospital and demonstrator of anatomy in the medical school. He was the constant assistant of Lister and was an expert surgeon. He performed one of the first major brain operations.

Godlee in 1884 was elected surgeon to the Brompton Hospital for Tuberculosis. He worked there for more than twenty years and wrote in collaboration with Sir James Kingston Fowler *Diseases of the Lung,* which was for long regarded as a standard book on the subject. It showed how great an extension of surgery had been provided by the development of antisepsis and bacteriology. In this book Godlee was responsible for that part dealing with the surgery of the lung and pleuræ.

In 1911 he was elected to the presidency of the Royal College of Surgeons. He gave the Bradshaw Lecture in 1907 and was Hunterian orator in 1913. In 1912 he was made a baronet. He was surgeon to the household of Queen Victoria, and later Surgeon-in-Ordinary to King Edward XII and King George V. During his term of office as president he went to America to deliver an address on the occasion of the foundation of the American College of Surgeons of which he was made an original member.

During the war he was chairman of the Belgian Doctors' and Pharmacists' Relief Fund, of which the editor of the *Lancet* was secretary. After the war Godlee practically retired to the country, where he occupied his time in country pursuits and in writing the biography of Lister.

Godlee, in addition to his professional skill, was an accomplished linguist, excellent water color painter, a good botanist and orinthologist, a farmer, a gardener, and no mean oarsman. He was an unassuming man whose Quaker training was exhibited throughout his life.

E. E. KLEIN, M.D., F.R.S.

London

Dr. E. E. Klein, who died February 9th, last, in London, at the age of eighty-seven, was one of the founders of bacteriology, a pioneer in modern normal histology Klein was born at Ersec, near Vienna, on October 31, 1844. In 1869 the New Sydenham Society in London determined to publish a translation of the *Manual of Human and Comparative Histology,* edited by Professor Stricker of Vienna. Professor Stricker had need of someone to arrange terms for the translation of the book and chose for the purpose Dr. Edward Emanuel Klein, the son of a Hungarian merchant. Klein, when he arrived in London, could speak no English, but brought introductions to the leading men of science of the day, Huxley, Burdon Sanderson, John Simon, and Henry Power. His manners, his evident knowledge, and good looks made a favorable impression upon the members of this circle, but when his work with respect to Stricker's affairs was completed, he returned to Vienna at the end of 1869 to continue teaching histology and embryology. In April, 1871, he was invited to return to England to undertake some histological and pathological researches in disease. He came and joined the staff of the Brown Institute, was given the title of assistant professor and placed under the direction of Burdon Sanderson, the superintendent of the institution. Here he worked strenuously, and issued a series of valuable reports on various acute and chronic infective processes. His findings and theories based thereon were so original that he was elected a Fellow of the Royal Society in 1875, while these findings and methods formed the foundations upon which the science of bacteriology was built. In 1873 he was appointed lecturer on histology at St. Bartholomew's Hospital. At about the same period he wrote the section on histology in the *Handbook for the Physiological Laboratory.* In 1879, together with Mr. Noble Smith, a well known orthopedist who was also a remarkable draftsman, he published a beautifully illustrated atlas of histology, and in 1889 a small but comprehensive *Elements of Histology,* which had a great vogue.

However, the real work of his life was investigating the origin of disease. He published the results in 1884, *Microorganisms and Disease;* an Introduction to the Study of Specific Microorganism. This book was the textbook on the subject up to 1896, when the science of bacteriology had arrived, and more advanced books were required. Klein gave up teaching histology in 1902, and was appointed lecturer on advanced bacteriology. At the same time he went on with his researches for the government, and among other work made a special investigation as to the causation of oriental plague.

News Items.

Hospital in Rheims.—The American Memorial Hospital for Children, at Rheims, France, has been formally dedicated. This is the first of a group of hospitals planned for construction. It was built at a cost of $300,000, and has an endowment fund of $600,000. Dr. M. Louise Lefort of New York, who has been in charge of the temporary hospital, will be in charge of the permanent hospital for the next two years.

Medical Advertising.—Surgeon General Cumming, of the United States Public Health Service, presided over a recent meeting called by the National Health Council, and held in the Metropolitan Life Insurance Building. The meeting was attended by many leaders in welfare and advertising, and resolutions were adopted aiming to stop fraudulent medical advertising, especially that promising cures for tuberculosis and cancer.

Sir Clifford Allbutt's Gifts to Cambridge Museum.—The Rt. Hon. Sir Thomas Clifford Allbutt, K.C.B., F.R.S., Regius Professor of Physic in the University of Cambridge, formerly a commissioner in lunacy, who died on February 22d last, aged eighty-eight, left an estate of the gross value of £56,963. He left to the Fitzwilliam Museum, Cambridge, his portrait by Sir William Orpen, and on the death of his wife, a quantity of antique furniture and drawings and paintings by noted artists, including Landseer, Crome, Romney, Rossetti, G. F. Watts, J. M. W. Turner, and Fripp. To Gonville and Caius College, Cambridge, his own college, he left three silver and gilt drinking horns, known as Swedish cups, requesting that his name as donor should be engraved thereon. He bequeathed fifty pounds each to the British Medical Benevolent Fund and the Medical Charitable Fund for the West Riding of Yorkshire.

Sydenham Hospital.—The cornerstone of the new Sydenham Hospital, at Manhattan Avenue and 123d Street, New York, was laid Sunday, May 17th. The Hon. Bird S. Coler delivered an address.

Postgraduate Course at Columbia.—Courses of three and six weeks' duration in public health, preventive medicine, and medicine, will be given at Columbia University from July 6th to August 14th.

Illinois Prenatal Work.—The state commissioner of health of Illinois has made arrangements for correspondence courses of instruction in prenatal care. Practical questions in preventive problems will be answered by qualified physicians.

Postgraduate Instruction.—The University of Minnesota School of Medicine and the state medical society have adopted a plan for postgraduate instruction, whereby clinicians will be sent to selected rural points one day each week for thirteen weeks.

Anniversary of Women's Medical College.—The seventy-fifth birthday of the Women's Medical College of Pennsylvania will be celebrated June 3d in Philadelphia. Starting with forty students, there are today fifteen hundred alumnæ. This is the only women's medical college in the United States.

Dinner to Doctor Howe.—Dr. Lucien Howe, of Buffalo, New York, was guest of honor at a dinner celebrating his fiftieth year in the practice of medicine. A silver loving cup was presented to him. Among the speakers were Dr. George deSchweinitz, of Philadelphia, and Dr. James W. Putnam and Dr. F. Park Lewis, of Buffalo.

Study of Public Health Activities.—Dr. James A. Tobey, recently of the National Health Council, is conducting a study of federal public health activities, for the Institute for Government Research of Washington. A preliminary study shows at least twenty-six bureaus or branches of the federal government interested in public health work.

Memorial at Cathedral.—A fund is being collected to erect a bay with stained glass windows in honor of St. Luke in the Cathedral of St. John the Divine, New York. Sculptural figures of great healers and illustrations in stained glass of great events in medical history will be used in decoration. Dr. John Bentley Squier, Jr., of New York, is chairman of the division for the medical profession.

Medical Arts Building.—A new twelve story building in Oklahoma City has been opened, with about forty per cent. of the physicians and dentists of the city occupying offices. It is expected that eventually the building will be tenanted entirely by members of these professions. The Oklahoma County Medical Association's library is also in the building.

Hebrew University Campaign.—A campaign for one million dollars for the medical college and hospital of the Hebrew University, Palestine, has been started. A meeting of the American Jewish Physicians' Committee was recently held in New York, with Dr. Samuel J. Kopetzky presiding. Dr. Nathan O. Ratnoff is president of the committee and Dr. Emanuel Libman, treasurer.

Iowa Medical Library.—Pending construction of the new medical laboratory building of the Iowa State University, which will provide space for a library of 75,000 volumes, the medical books of the university have been collected and housed in the old chemistry building. The library has been increased by the collection of the late Dr. Pick, psychiatrist of Prague—some six thousand volumes.

Red Cross Memorial.—The Emergency Canteen of the American Red Cross, at a New York meeting, has voted fifteen thousand dollars for the endowment of a memorial room in the New Presbyterian Hospital. Dr. Thomas W. Salmon, one of the speakers, urged that the room be devoted to the care of mentally disabled war veterans. More than ten thousand dollars was subscribed on the day of the meeting.

Exchange of Scientific Publications.—The Russian Information Bureau in Washington is representing the Joint Information Bureau of Moscow in an endeavor to facilitate regular contact as well as an exchange of scientific periodical and nonperiodical publications between interested institutions, groups, and individuals of the Soviet Union and this country. Personal exchange of work between scientists engaged in similar research activities could be arranged as well as the publication of manuscripts and articles in the general periodical and special press. Information may be obtained from the Russian Information Bureau, 2819 Connecticut Avenue, N. W., Washington, D. C.

New Fellowship.—A fellowship in experimental medicine at the University of Cincinnati, which will provide six hundred dollars a year for three years, is to be established through the generosity of Dr. and Mrs. Alfred Friedlander.

Reunion of Medical Officers.—A dinner will be held May 27th at the Ritz-Carlton Hotel, Atlantic City, as a reunion of medical officers serving in the world war. Tickets may be obtained from Colonel Burt R. Shurly, 62 West Adams Avenue, Detroit, Michigan.

American Academy of Physiotherapy.—This society will hold its midyear meeting at Atlantic City, Monday and Tuesday, May 25th and 26th, at the Chalfonte-Haddon Hall. There will be a session devoted to miscellaneous subjects, one on ultraviolet therapy, and one on electrosurgical methods.

American Proctologic Society.—The American Proctologic Society will hold a meeting at Atlantic City, May 25th and 26th, at the Ambassador Hotel. The four sessions will be devoted to anesthesia in rectal surgery, anorectal fistulæ, hemorrhoids, and cancer of the rectum. Dr. Frank C. Yeomans, of New York, will deliver the presidential address.

Personal.—Dr. Florence Sabin has resigned as professor of histology at Johns Hopkins Medical School, in order to devote her time to a further study of blood cells at the Rockefeller Institute. Doctor Sabin was recently elected a life member in the National Academy of Sciences, the first woman so honored.

Dr. George Miller MacKee of New York has resumed personal charge of his practice after a long absence.

Dr. David E. Hoag, who for several years has been lecturer in the department of Nervous and Mental Diseases at the New York University and Bellevue Hospital Medical College, has been made clinical professor.

Dr. Perry G. Moore, of Wabash, Indiana, was presented a watch by members of the Wabash Medical Society, to commemorate his eightieth birthday. Doctor Moore has been in practice fifty-nine years.

Dr. Samuel T. Darling of Baltimore is at the head of an expedition sent out by the Rockefeller Foundation, for the study of malaria in the Mediterranean countries.

Dr. William H. Walsh of Philadelphia has been appointed executive secretary of the American Hospital Association, succeeding the late Dr. Andrew R. Warner. Doctor Walsh formerly held this position, resigning at the time of the war.

Dr. Meyer A. Rabinowitz, visiting physician to the Jewish and Greenpoint Hospitals of Brooklyn, has gone to Europe four months, during which time he will visit the leading medical centres.

Dr. William Visher of New York has been appointed associate attending urologist at the Daughters of Jacob Home for the Aged.

Prof. E. Kraepelin, director of the Munich Research Institute for Mental Diseases, and Prof. F. Plaut, director of the Serological Department of the Institute, are in America studying the psychoses of the negro and Indian from the viewpoint of comparative psychiatry. They will spend some time at the Government Hospital in Washington.

Dr. James B. Murphy of the Rockefeller Institute has been elected foreign member of the *Deutsches Zentral-Komitee zur Erforschung und Bekampfung der Krebskarankheit*, of Berlin.

Dr. Daniel H. Eisendrath of Chicago read a paper on Strictures, Kinks, and Abnormal Ureteral Insertions as Causes of Abdominal Pain, before the New York Academy of Medicine.

Dr. William P. Healy of New York spoke on Carcinoma of the Uterus, Treatment by Irradiation, at the joint meeting of the New York and Philadelphia Obstetrical Societies, recently held in Philadelphia.

Dr. Louise Pearce, of the Rockefeller Institute, has been elected a Fellow of the Royal Society of Tropical Medicine and Hygiene.

Dr. E. A. Balloch, professor of surgery in the Howard University School of Medicine, of Washington, D. C., who has been on its faculty since 1880, was recently honored by a testimonal dinner given by the Howard Medical Reading Club of New York.

Dr. Arthur C. Strachauer, of the University of Minnesota Medical School, has become director of the new George Chase Christian Cancer Institute of the University, a research institute and fifty-bed hospital donated by Mrs. George Chace Christian.

Foreign Correspondence.

LONDON LETTER

(From our own correspondent)

London, *March 27, 1925.*

HARNESSED RADIUM

According to Mr. Courtauld, speaking when presiding at an annual court of the governors of the Middlesex Hospital, remarkable results have been obtained in the tests to capture radium. He declared that the emanations from radium had been captured, purified, condensed and bottled in tiny tubes and the Middlesex Hospital was now in a position to offer supplies to other hospitals. During the past few weeks the hospital had been testing with excellent results a new method for distributing radium for the treatment of disease. In the Radon Centre of the hospital emanations from radium had been bottled in small tubes. (For the sake of brevity, radium gas had been named radon.) To accomplish this it had been necessary to install an expensive plant. This the hospital had been able to do with the help of funds provided by the Medical Research Council which was also providing the means necessary to pay a part of the salaries of an expert staff and maintain the installation. Until it was proved possible to capture radon and bottle it for distribution, the Middlesex Hospital had been compelled in the interests of its important cancer wing and its extensive research work to husband its stock of radium and refuse to part with small doses, this in spite of the fact that it holds the largest individual stock of radium in the world. Now after exhaustive trial in its own hospital and in St. Bartholomew's, to which it had been sending two radon tubes a week, the Middlesex Hospital was in a position to supply these curative tubes to other hospitals. The possibilities for the treatment of disease by this new method of distributing and applying radium were very great. By capturing the gas which would otherwise be wasted it was now possible to multiply thousands of times the curative value of any given quantity of radium.

Stripped of technical details the method used in collecting radon was as follows: In a room at the Middlesex Hospital Radon Centre was a ray proof box containing flasks, each of which held a quantity of radium salt in solution. From one of these flasks a vertical glass tube conveyed the radon through a hole in the wall to another room containing apparatus, by means of which the gas was purified and condensed with the aid of liquid air. In its condensed form the gas was passed into minute glass tubes called seeds and resembling small beans. Each of these was sufficient for a dose, in other words, its power of giving out the gas again held good for a definite time. In order to estimate the value of each seed before it was sent out, or used in treatment, an extremely interesting radon balance had been designed, and could be seen in operation. Before the Middlesex Hospital dispensed its radium emanations it was therefore able to satisfy itself that the process of bottling had been successful and that the seed would do its work on arrival at its destination. These seeds were valuable in all cases in which radium itself would be used.

NEW HOSPITAL IN SUSSEX FOR WOMEN AND CHILDREN

On the occasion recently of the annual meeting of the governors of a new hospital for women and children at Brighton, a hospital officered entirely by women doctors, Dr. Mary Scharlieb, C.B.E., opened the new x ray department. The present premises of the hospital were only opened in August, 1921, but already there is need for extension from thirty to fifty beds and a preliminary appeal is being issued for $100,000 to enable another wing to be built.

WOMAN DOCTOR'S SACRIFICE

At the Infants Hospital, Vincent Square, London, an eleven months' old twin was in a wasting condition when received at the hospital and two months' treatment produced no improvement. It was then decided to try blood transfusion. The father was not available, the mother gave her blood but fainted and then the woman physician in charge volunteered. Three times in the course of ten days blood was transferred, the amount given in all being half a pint, and with each transfusion the baby put on weight, and has since improved enormously.

ROYAL FREE HOSPITAL NEW NURSES' HOME

Lord Riddell, the president of the Royal Free Hospital, London, the hospital of the Medical School for Women, on March 27th opened the Alfred Langton Home for Nurses attached to the hospital. Lord Riddell announced that the home was opened free from debt. The whole cost of building and equipment totalled $210,000, but the amount has already been secured by funds specially raised, towards which Mr. Langton has been a generous contributor.

THE SKULL OF BRUCE

Sir Arthur Keith, the curator of the Royal College of Surgeons and one of the greatest anatomists and anthropologists, has been writing recently on the characters of skulls. In this article he refers to a recent pronouncement by Prof. Karl Pearson to the effect that the human skull has a language of its own; one which it is hard to decipher. After centuries of endeavor we can construe only its simpler hieroglyphics: Yet we do continue to improve, and our progress justifies the belief that the day will arrive when a rational craniology will become the handmaid of biography. Both Prof. Karl Pearson and Sir Arthur Keith have been writing their views on the skull of King Robert Bruce, a cast of which is in the museum of the Royal College of Surgeons, where it is placed cheek by jowl with that of Robert Burns. Sir Arthur Keith and Prof. Karl Pearson reached their conclusions by different methods, yet the main conclusions reached by each are in agreement. The skull of the Bruce has characters of the most outstanding kind, chief of which are the rugged robustness of its face, the outstanding ridges over the eyes, the enormous width across the face from jowl to jowl, and the strength of the jaws. He was bull necked as is plainly indicated by the extent and strength of the bony platform on the base of the skull whereto the neck is fixed. Such an extensive platform signifies large and strong muscles in the neck, and such muscles in the neck require equally strong muscles in the spine and body. There is in the museum of the Royal College of Surgeons a rib of King Robert; it is the ninth of the left side. It had

been broken in some mischance which had befallen the king, but had healed well and soundly. The rib shows him to have been a big chested man; one we should expect to have a relatively long body; and yet his thigh and leg bones were not long. Professor Pearson finds that their dimensions answer to those of a man about five feet six inches in height. Bruce may well have been one of those men who seem tall when seated and yet of medium height when standing up, in which case we may add two or three inches to the estimate given by Professor Pearson. Sir Arthur Keith asks of what race was Bruce? Professor Pearson following tradition looks upon him as a hybrid between Norseman and Celt and adds, "He was able by Celtic imagination with a certain dash of slimness to win the Scottish nation to his side, and by aid of Nordic physique and persistency to be triumphant over his enemies." Sir Arthur Keith says that this statement might well be a quotation from the speech of a political historian but it certainly is not the language of craniology. The term Celt has been applied to diverse breeds of men, but Bruce's cranial type is not prevalent in any of them. Nor is it a type which is found in Saxon or Danish graveyards, although samples do occur in the Frankish burials of the north and west of France. Bruce's skull has more in common with what has been named by British anthropologists in recent years the beaker type than with any other known to the writer. Men with this type of skull began to take up their habitation along the eastern coasts of Britain in the second millennium B.C. They are known as "beaker" men because of the peculiar kind of earthenware vessel buried with them. Before they appeared in Britain they had penetrated to Baltic lands and spread southwards into France. Bruce's ancestry may have acquired the beaker blood in Baltic lands, in France or in Cleveland, where the type still persists.

LATIN AMERICA LETTER

(From our own correspondent)

Balboa Heights, C. Z., *April 15, 1925.*

GENERAL IRELAND VISITS CANAL ZONE

Surgeon General Merritte W. Ireland, United States Army, recently made an inspection of the sanitary and health conditions of the Canal Zone. He visited the hospitals and health offices to note the methods of administration, the quarantine stations, the Palo Seco leprosy colony, and the various army posts on the Zone. He was particularly pleased with the methods of sanitation including the mosquito control and the sewage and garbage disposal systems. He also visited the cities of Colon and Panama where the sanitary work is under the control of the Health Department of the Canal Zone.

HOOKWORM DISEASE IN PANAMA

Thanks to the energetic campaign of the Rockefeller Foundation, hookworm is being stamped out of Panama. The school children are learning about this intestinal parasite and how to avoid it. Better sanitary conditions are being installed. As a result of the campaign the Panaman native is being emancipated from this evil which has held him down helpless for decades and which has given him a name he does not deserve. Dr. Louis Schapiro, of the Foundation, who has charge of the work in Panama, said recently that a great deal of educational work was being done throughout the entire Republic of Panama, especially in the remote districts. He expressed the belief that it would not be long before the natives of all the villages would have been given treatment and educated in the control of the disease.

NOTED JAPANESE SCIENTIST VISITS CANAL ZONE

Dr. J. Hatori, biologist of the Institute of Science and Chief Health Officer of the Island of Formosa, Japan, recently stopped at the Canal Zone en route to the United States where he will visit the principal cities for the purpose of observing municipal health administration. He has recently completed a tour of South and Central America for the same purpose. Dr. Hatori is interested in certain problems of the United States Public Health Service, such as Rocky Mountain spotted fever, tularemia and other diseases transmitted by ticks and insects. He will spend a certain amount of time in the Bitter Root Valley of Montana, collecting ticks which transmit the spotted fever. While in Panama he made a collection of red bugs in order to find out if these are the same specie that cause the tsutsugamushi fever of Japan. While in the United States he will visit the hygienic laboratory of the Public Health Service and also the Army Medical School.

VETERAN CARE IN THE CANAL ZONE

To facilitate the hospitalization of claimants on the Isthmus, entitled to consideration under the World War Veterans' Act of 1924, the director of the Veterans' Bureau by letter of February 17, 1925, has vested the Governor of the Panama Canal with the following authority:

Authority is hereby vested in the Governor or the Acting Governor of the Canal Zone to extend medical and hospital treatment to U. S. ex-service men who it is believed after an examination, which should be made in each case, are in need of such treatment.

This service will be extended only to World War Veterans, and to veterans of any war, military occupation or military expedition since 1897, not dishonorably discharged, without regard to the nature or origin of their disabilities, provided that preference to admission to any government hospital for hospitalization under the provisions of this subdivision shall be given to those veterans who are financially unable to pay for hospitalization and their necessary travelling expenses.

This authority is based on Section 202 (10) of the Act of June 7, 1924, and the persons entitled to the benefits thereunder who require hospitalization or who desire information relative to such service should apply direct to Surgeon C. P. Knight, Chief Quarantine Officer of the Panama Canal, who is hereby appointed to handle the Veteran Bureau work under the direction of the Governor.

SAILORS MADE ILL FROM FOOD POISONING

More than 200 sailors were recently made suddenly ill at the Naval Submarine Base at Coco Solo, Panama, from spoiled food. Some were taken to the Colon Hospital, while those less seriously affected were treated at the Base by the Naval Medical Officers. No fatalities resulted but many of the men were extremely ill. The attack came suddenly and within a comparatively short time many cases were admitted to the hospital. Men on pass were stricken and taken to the hospital. At the base out of a company of sixty marines fully two thirds of them were stricken at the same time. Sailors who were ill de-

clare that the illness was caused by boiled tongue. It is understood that the men who did not eat the tongue were not affected in any way. An investigation has been ordered by the Commanding Officer but the results are not yet known.

CHILD HEALTH ACTIVITIES

The Mothers' Association of the Canal Zone held its regular monthly meeting the first Friday in April at Balboa. A health centre in Pedro Migel has been attended to overflowing the last two sessions. This makes the fourth health centre in operation on the Zone.

WEIRD CRAFT ARRIVES IN CRISTOBAL

The ship *Arcturus* bearing a scientific expedition bound for the Sargasso Sea and the Island of Galapagos in charge of Professor William Bebee, explorer and naturalist, arrived at the port of Cristobal the early part of April. After a few months in the Sargasso Sea the *Arcturus* will return and transit the Canal, proceeding to Galapagos where Professor Beebe will continue certain researches which were started over a year ago. This vessel is fitted out with a more wonderful and fearful equipment than any previous seagoing craft carrying a scientific expedition. A large laboratory has been built forward of the bridgedeck, tanks have been installed to keep fish alive as well as cages for wild animals, birds and reptiles. All appliances for dredging and trawling are installed and the ship has on board a dozen small boats with glass bottoms.

EXCLUSION OF UNDESIRABLES FROM CANAL ZONE

The Governor of the Panama Canal has recently issued an amendment to the immigration regulations governing the right of undesirable persons to enter the Canal Zone. The text of the order follows:

The Division of Quarantine shall be charged with the exclusion of undesirable persons at any time that cause for such exclusion shall come to their knowledge whether at time of entry of such person or subsequent thereto, if they shall find, after hearing that such person comes within any of the classes to be excluded: but in no case shall they act for causes arising subsequent to entry.

An order for the deportation of any person may be made by the Governor at any time that it shall be made to appear to him after hearing before the Police and Fire Division, that such person is undesirable from any of the causes mentioned in such acts and executive orders, by certificate of such hearing and finding by the said Fire and Police Division: provided, that in all orders of deportation the Governor shall set forth the finding on which the order is based."

Detention for inquiry as to the status of any person may be made by the Police and Fre Division on complaint of the Division of Quarantine and in construing this order the word "exclusion" as used herein shall mean the keeping out or putting out of a person for any disability within the meaning of the Act of Congress or Executive Order, which would bar entry and would continue as such until it becomes known and acted upon.

Deportation shall mean the eviction from the Canal Zone of any person who shall have entered with a lawful right but because of conduct or other cause arising after entry has become an undesirable within the meaning of the act."

When a person coming within any of the undesirable classes shall arrive at a Canal Zone port and shall desire to cross the Canal Zone in transit to another country, the agreement in writing required under the Executive Order from the owner, master or agent or interest controlling the vessel shall be secured by the Quarantine Officer."

VITAL STATISTICS OF THE CANAL ZONE

A total of 146 deaths occurred during the month of February, 1925, among the population of the Canal Zone, and the cities of Panama and Colon, which is equivalent to an annual death rate of 14.05 per thousand. The leading causes of deaths were: Tuberculosis (various organs), twenty-nine; pneumonia (bronchial and lobar), fifteen; cancer (various organs), eleven; nephritis (acute and chronic), eleven; diarrhea and enteritis (including colitis), ten. There were eight deaths from apoplexy and four from organic diseases of the heart. Of the total deaths, fifty, or thirty-four per cent., occurred among children under five years of age. There were eleven deaths among nonresidents of the Isthmus; these are not included in the above statistics.

There were 298 live births reported during the month, and twelve stillbirths. Including stillbirths, this is equivalent to an annual birth rate of 29.84 in 1,000 of population. Deaths among children under one year of age numbered thirty-three, giving an infant mortality rate of 110.74 in 1,000 live births.

The total number of malaria cases reported during the month was 102. Of these, nine were reported from Panama City, four from Colon, thirty-five from Canal Zone sanitated areas, and fifty-four originated outside of our sanitated areas. Of the total, eleven were employees, fifty were nonemployees, and forty-one were Army and Navy personnel. There were two deaths from malaria.

MOSQUITO CONTROL EXTENDED IN THE CANAL ZONE

Bearing in mind that the coming rainy season will bring a great addition of anopheles mosquitoes, the Health Department is extending mosquito control this year further than it has for several years past. The former boundary for ditching and draining was one mile beyond a thickly settled area, but this has been increased to two miles. Dr. C. P. Curry, in charge of the Division of Sanitation, has placed a large crew of laborers in old Panama on the Pacific side and also beyond Colon on the Atlantic side making new drains to take care of the extensive rains contemplated within the next few weeks. While the present death rate from malaria cannot be compared with that of construction days, this disease is still a menace to the employees of the Panama Canal, and every effort is being made to keep the death rate as low as possible.

ALASTRIM IN JAMAICA.

Weekly reports to the Chief Quarantine Officer of the Canal Zone show that alastrim is still prevalent in Jamaica. This disease is thought to be a mild form of smallpox and is controlled by vaccination the same as smallpox. Besides in Jamaica alastrim has been discovered in other countries too, Africa and Brazil. The authorities of Jamaica think that it is a distinct disease, but Dr. M. J. Rosenau, of Harvard University, gives the opinion that alastrim is simply modified smallpox, and he gives the following reasons: First of all smallpox is a disease which presents mutations and varies more than any other disease. The main thing from the viewpoint of prevention is that vaccination for smallpox also prevents alastrim. Alastrim, like smallpox, can never be controlled in Jamaica until universal vaccination is accomplished.

Book Reviews

RHEUMATIC HEART DISEASE

Rheumatic Heart Disease. By Carey F. Coombs, M. D., F. R. C. P., Lond. With an Introduction by F. J. Poynton, M.D., F.R.C.P., Lond. New York: William Wood & Co., 1925.

Few if any books that treat of heart disease portray the natural history of the several cardiac affections. They content themselves with describing various episodes in the evolution of the cardiac disorders. The student is left with a clear picture of endocarditis, pericarditis, myocarditis, cardiac insufficiency, each as a separate entity, but with little realization of the fact that all of these processes are, or may be, different phases of the same disease process in one person.

Not alone is rheumatic heart disease one of the most serious and frequent of all cardiac affections, but it presents itself to the clinician in a most variegated clinical picture. Dr. Coombs has performed a real service in writing this monograph which has as its central thesis the fact that rheumatic fever is an infectious disease which invades the whole body, and which, attacking the heart, may manifest itself in a multitude of ways, and with diverse physical signs and symptoms. Furthermore, he writes with authority, and with the knowledge of one who has been a student of the subject for many years.

There are a number of Dr. Coombs's conclusions with which most American cardiologists will be inclined to disagree. He accepts the streptococcus of Poynton and Paine as the proved cause of rheumatic fever, and he suggests that subacute infective endocarditis may be caused by the same organism. We do not see forms of scarlatinal carditis whose lesions are identical with those of true cardiac rheumatism. The author holds that mitral stenosis is always caused by rheumatism. This is certainly an exaggerated statement, for while it is true that rheumatism is most often at fault, instances of true arteriosclerotic narrowing of the mitral valve have been described, not infrequently, and verified at postmortem.

The chapter on pathology in which Dr. Coombs attempts to show that the specific lesions of rheumatism are the same in the myocardium, epicardium, valves, subcutaneous nodules is very interesting, and is illustrated with many original microphotographs. The illustrations are not always so clear and convincing as one might wish as evidence in a controversial subject. The weight of present opinion is certainly against the view that the specific Aschoff nodules arise from the intimal vascular endothelium, for they seem to develop first in the adventitia of the bloodvessel.

The most valuable section is the one on prognosis. Dr. Coombs was able to follow up a series of over six hundred cardiac cases after a maximum interval of fifteen years, and he formulated his conclusions from a study of this series of cases. This is a unique contribution to the subject of prognosis. He found that of one hundred patients who, when first seen, showed signs of definite rheumatic heart disease, recovery occurred in thirty-one, death ensued before the age of twenty in twenty-eight, before the age of thirty in thirty-eight, and before the age of forty in fifty patients; those who survived the age of forty though crippled, numbered nineteen. The highest incidence of fatalities is in the second decade.

DIAGNOSIS

Physical Diagnosis. By W. D. Rose, M.D. Fourth Edition. Three Hundred and Nineteen Illustrations. St. Louis: The C. V. Mosby Company, 1924.

The fourth edition of Rose's well known and deservedly popular work has been revised by the addition of new, and the elimination of old, illustrations and by minor alterations in the sections on graphic registration of the heart beat, on myocarditis, and on aortitis.

The bulk of this work is taken up with the clinical anatomy and physical signs of the respiratory and circulatory organs, and with the examination of the abdomen and viscera. There are additional chapters on the head, neck, and extremities, and on the nervous system. Where so much is given and so well, it may seem captious to find fault with the necessarily inadequate presentation of the physical examination of the eye, ear, and accessory nasal cavities, as well as the omission of some practically important details of the special application of clinical radiography.

Most of the illustrations are excellent, both instructive and technically fine. This does not, however, apply to the representations of x ray plates, some of which are so cloudy or so badly printed as to be of little value.

SURGERY

Operative Surgery. By J. Shelton Horsley, M. D., F.A.C.S. Second Edition. With 666 Illustrations. St. Louis: C. V. Mosby Co., 1924. Pp. 784.

This is a splendid book to have in association with other works on operative surgery. It is not a complete work taking in all types of surgery but one in which unusual operative procedures or later developments can be looked for. For instance, in the second edition the following new subjects have been brought up: "Among the interesting new operations described in this edition—none of which, so far as I am aware, has heretofore appeared in any surgical textbook or monograph—are the following: The lymphaticostomy of Costain for diffuse septic peritonitis and late obstruction of the bowels the operation of Stookey for innervating paralyzed muscles; the pylorectomy of Finney; the pulmonary lobectomy of Evarts A. Graham; the valvotomy of Cutler for mitral stenosis; the operation of Coffey and Brown for angina pectoris; the chordotomy of Frazier, and the intestinal resection of Kerr. This latter operation, when applied to resection of the cecum and right colon is, in avoiding infection, so superior to the technic I devised for removing this segment of the large bowel that I have abandoned my operation and adopted that of Kerr. The operations of Crile for partial lobectomy of the thyroid and ligation of the superior thyroid arteries are fully described. The technic of gastroenterostomy without clamps is given. A modification of the Billroth operation for partial gastrectomy is described. Two new procedures are included

in the chapter on plastic surgery. Many other less important changes or additions have been made."

The author has a clear and lucid manner of describing operations. He is wise enough to give the disadvantages as well as the advantages of the various descriptions. Many of the illustrations are photographs and photomicrographs of real clinical cases which add to the value of the work. The part devoted to plastic surgery is well written and illustrated and is of great value.

Dr. Horsley's work on the stomach is particularly interesting, as it describes in full his own operation, which has recently received a good deal of approbation. He also describes with very good illustrations the latest operation of Finney, which is a pylorectomy in which the stump of the stomach is sutured to the side of the duodenum making an end to side union. This is in reality a Polya with the duodenum used instead of the jejunum. The difficulty of this operation for the general surgeon is in the free mobilization of the duodenum. This is done by incising the peritoneum along the inner side of the duodenum from the stump of the duodenum lower down for a distance of about three inches below the level of the head of the pancreas.

The reviewer can thoroughly recommend this work for one who wishes information concerning the newer operations which are not in the ordinary works of surgery.

GYNECOLOGY

Gynecology. Medical and Surgical. By P. Brooke Bland, M.D. With 644 Illustrations, including forty-three colored text figures and twelve insert plates, ten of which are in colors. Philadelphia: F. A. Davis Co., 1924.

The reviewer feels that this is one of the best works combining both medical and surgical gynecology that he has had the privilege of reading. The author has a clear style, classifying his subjects in a systematic manner and supporting many of his statements with statistics. He shows remarkable knowledge of the literature. The part on sterility is particularly praiseworthy, as he goes into the sociological, the physiological and the pathological causes. The sections on surgery are clear and unbiased, clearly described, and adequately illustrated.

As a textbook and as a book of reference this is a thoroughly admirable work. The index is complete and well subdivided, so that it is easy to look up any particular subject.

THE INTESTINE

Nouveau Traité de Médecine. Fascicule XIV, Appareil Digestif (Intestin). Paris: Marson et Cie, 1924. Pp. 579.

This volume represents the authoritative French work on the intestine. The material is presented under six heads: 1. Pathology of the Intestine by Tremolieres and Caussade. This is much more than pathology in our narrower sense and includes etiology, symptomatology, diagnosis and treatment—in short a complete clinical study. 2. The gastrointestinal affections of infants by Nobecourt. 3. Intestinal Worms by Joyeux. 4. Ankylostomiasis by Perroncito. 5. Semiology of the Feces by Gaultier. 6. Pathology of the Rectum and Terminal Colon by Bensaude.

The book is well edited and the material well arranged. The illustrations are good, the colored plates of pathological specimens being really splendid. However, the x ray reproductions are not up to our standard.

As in other French works, one notes the absence of important allusions to the work of non-Gallic writers. This, however, is more of a loss to French readers than to us. More important and less understandable is what looks like carelessness in omitting an index. Why, after all, should not French books be made as accessible to rapid reference as books in other languages?

BACTERIOLOGY AND SEROLOGY

Manuel Technique de Microbiologie et Sérologie. Par le Professeur A. Calmette, S.-Directeur de l'Institut Pasteur, L. Nègre et A. Boquet, chefs de laboratoire à l'Institut Pasteur. Paris: Masson et Cie., Editeurs. 1925. Pp. 568.

This admirable technical manual from the hands of Professor Calmette and his assistants contains a very full survey of bacteriology and serology. It makes no pretensions to style, and is written in the usual laboratory jargon. It contains a good deal that is not in the ordinary bacteriological textbooks, such as the methods for obtaining cultures from various cavities of the body, directions for making vaccines, toxins, and antitoxins, and for checking them. There is also a section on the destruction of parasites of animals, and the general procedures of disinfection. These are valuable in any laboratory where the keeping of animals free from such infestation is an important part of their care. For those who read French this book is a useful addition to laboratory technic.

THE CHILD MIND

Vom dichterischen Schaffen der Jugend. Neue Beiträge zur Jugend forschung. By Dr. Siegfried Bernfeld, Quellenschriften zur seelischen Entwicklung, No. III. Leipzig, Wien, Zürich, Internationaler Psychoanalytischer Verlag, 1924. Pp. 285.

This book is offered as a preliminary study in a field as yet almost unexplored and of dimensions so vast that there can be only suggestion here of the opportunity both for psychological and literary investigation. Extracts are presented illustrative of the variety of material which comes under consideration. There are the immature expressions of the young child or the profuse but formless utterances of slightly later years; there are the better developed stories of later adolescence, in which the "tertiary," more objective elaboration of the simpler self expression is already taking place; there are examples of early literary efforts from some writers who have later found a place in literature; there is material also from the phantasy of children manifested in the fictions of play rather than committed to writing. The author's purpose is not to show exclusively or primarily the beginnings of literature; it is to bring before consideration the nature and content of these outpourings of children and adolescents, particularly as they take written form. This latter happens far oftener than would be revealed by later literary careers. For much of this output has no literary merit as such nor does it indicate a special inclination toward continuance in writing. Neither, the author notes, is writing a spontaneous means of expression for all children; some find expression for their infantile and adolescent complexes and aspirations in

this way; many do not. Only lightly has the author touched upon the revelation of complexes and strivings in the material examined. His purpose at first is only that of making a beginning in the collection and setting forth of material: the time for interpretation will come later.

CHILD PSYCHOLOGY

Safeguarding Children's Nerves. A Handbook of Mental Hygiene. By James J. Walsh, M.D., Ph.D., Sc.D. With a Foreword by Honorable Herbert Hoover. Philadelphia and London: J. B. Lippincott Company, 1924, pp. ix, 272.

This book gives many items of good advice and some useful information as to a child's makeup and how to meet the needs based upon this. It is written, however, from the old standpoint of a superficial laying out of facts to be thus examined and talked about. Such advice fails discouragingly, and why? The message to be brought over to parents and to doctors today, and brought forward forcibly, practically, is that of a dynamic nature within the child, affectively charged; determining his likes and dislikes, his manifestations of detrimental habits, his willfulness, negative and inhibitory as well as actively directed; the fundamental condition of his "nervousness" as of that of his parents. The book scatters itself in its disconnected homilies on proper care and attention. It evades these issues of cause and effect which necessitate a deeper understanding of the child's nature. So much good fact in the book, if only brought together and vitalized by the inner truths of the child's psyche!

FICTIONAL ANTHROPOLOGY

The Long Journey. Fire and Ice; The Cimbrians; Christopher Columbus. By Johannes V. Jensen. New York: Alfred A. Knopf, 1923, 1924.

Man is a migratory animal. This is the song of his travels. This, and nothing more. That Jensen has produced an epic in part and in part a treatise, is not his fault. Neither is the fault in his material. Man wearies of sustained effort. He must be ever seeking something new, aching to be on with it, leaving usually the last bit of his present task a trifle rough lest he lose the golden dream of the new. And this is what seems to have happened in Jensen's trilogy. Moreover, his imagination flames to primitive man, to man in the struggle years. When most of the conflict with Nature is eased, and only the dramatic conflict of souls is left, his theme does not grip him in quite the same way. It is a difficult picture to maintain, one man embodying the seething mass of scarcely human beings fighting their way through *Fire and Ice* to the barbaric Cimbrian days—to reach, finally, Christopher Columbus, one man who blots out the seething mass, not of human beings any more, but their puppetlike unchanging ideas. This shift, accidental or otherwise, weakens the powerful hold of the story. It must have weakened the author's interest, or else betrays his flagging effort.

No other writer has so vivified life for us. We know in theory about Neanderthal man, homo Heidelbergensis and all the later comers. But Jensen has *felt* them, dreamed their lives, lived them through long years of minute ethnological research. They still live to him—a prototype of his hero *Guest,* passing the aeons in review by all the aids of science.

Fire and Ice, the first volume in the English translation, is the story of man's rise from beast. The possession of fire aids him in his climb. Adaptation to environment follows. Man can begin to live where he chooses. Man like his predecessors, plant life, animal life, increases to the point of self destruction. Man being movable, does move.

Then in *The Cimbrians* we have the migrations. Then comes the conflict of man and man—the building up of memory, history, mentality. The grindstone of mental contacts, civilization. Rome totters before the wave of barbarism, just as in Yucatan, human carved wonders have succumbed to the wave of vegetation springing into its own again. And if Rome conquers it is only a respite. Minds become more subtle, destruction more intense, conditions more vile. The old world must expand or suffocate in its own combustion.

And so, *Christopher Columbus.* This is the epic, not of the rise of man, but of his downfall. The author may not have intended it as such, but he has clanged a truth. Man is destroying himself by the misapplication of "progress." So long as progress meant creative effort there was beauty. So soon as "progress" became conscious, there was room in man's soul only for greed. A long journey, and maybe futile. Let us at least admit the possibility and cast about for the cure.

MILITARY MEDICINE AND PHARMACY

Report of Second International Congress of Military Medicine and Pharmacy. Rome, May-June, 1923. By Commander William Seaman Bainbridge, M.D. Reprinted from *The Military Surgeon,* December, 1924, January and February, 1925. Washington: The Military Surgeon, 1925. Pp. 148.

This report covers such subjects as evacuation of the wounded, collaboration of military and civilian authorities in matters of national health, disinfection and disinfestation, treatment of chest wounds, and chemical laboratories.

The international viewpoint is well maintained through the collaboration of representatives from twenty-seven countries.

Medicoliterary Notes.

The *Yale Review* for April contains several popular yet authoritative articles on scientific and sociological subjects, among them The New Physics and the Stars, by Henry N. Russell; The Child and the Law, by Agnes Repplier; Democracy and Education, by James Rowland Angell; Southern Spindles, a comment on the future of industry in the South, by Broadus Mitchell; and Insular America, by William Howard Gardiner.

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The European press has recently been commenting on the establishment in April of a new organization, the British Institute of Philosophical Studies. The aim of the new institute will be to apply the principles of philosophy to the present unsettled conditions of political, industrial and social life, and to encourage the study of philosophy by the general public. The Institute will offer both day and evening courses, and will also give advice and other assistance to those wishing to read along philosophical lines. A research library will be established, and public conferences will be held for addresses and discussions on philosophical subjects.

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Aesculape (Paris) for February contains an article by R. Tait Mackenzie, professor of physical education at the University of Pennsylvania, on Facial Expression Under Stress. Several excellent plates are included of masques

from faces showing various forms of expression, such as effort, fatigue, and exhaustion. Another article with interesting illustrations is on the Manor of Laennec, by Dr. De Backer and Dr. Larbaud.

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The Equipment of the Rolls-Royce air express of Imperial Airways, in which the first aerial cinema show will be given whilst the machine is in flight, has been completed. The cinema projector has been installed in the luggage compartment at the rear of the passenger cabin, and the screen erected against the bulkhead which separates the passengers from the pilot's cockpit. Fourteen spectators will be accommodated in two rows of armchair seats running down either side of the cabin. The star picture is advertised by big streamers on either side of the air express.—*Manchester Guardian Weekly.*

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Books announced for the month are *Concerning Evolution,* by Prof. J. Arthur Thomson, of the University of Aberdeen (Yale University Press); *African-Armenian Mythology,* by Alice Werner and Mardiros Ananikian (Mythology of All Races Series, Marshall Jones Company); *Concerning the Nature of Things,* by Sir William Bragg (Harper); *The Spirit of the Hive,* by Dallas Lore Sharp (Harper); *Everyman's Genius,* by Mary Austin (Bobbs Merrill Company); and a new unabridged edition of Boccaccio's Decameron, with illustrations from etchings by Clara Tice (Boni & Liveright).

* * *

Considerable interest is being manifested in England, judging from press reports, in the opening of the box of prophecies made by Joanna Southcott in the early eighteen hundreds. One of these boxes has been already opened by a man in Hammersmith, to whom it was left many years ago by a woman who swore that infinite curses would be showered upon the head of the opener. The gentleman, however, became tired of having the box in his cellar and opened it, and a whole mystery story could be woven about the incident. The box was small, charred by fire, and bound with iron bands, roped and sealed and screwed together. Inside was found an old copy of the New Testament, between the covers of which were a wisp of gray hair and a torn scrap of parchment on which was written the following prophecy: "At that time there shall not be wanting signs of these things to come. Bones of unknown creatures, as many as there are bishops, shall be dug out of the earth, and monsters of the Lost World shall live, and men shall be made to wonder . . ." Which suggests the statement that the moving picture, The Lost World, by Sir Arthur Conan Doyle, is excellently filmed and well worth seeing.

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The series of leaflets on *Habit Training for Children,* prepared by Dr. Douglas A. Thom and members of the staff of the Division on Mental Hygiene of the Massachusetts Department of Mental Diseases, is being published in Italian by the National Committee for Mental Hygiene. They will be ready for distribution soon. A translation of these leaflets into Yiddish is now being prepared.—*Mental Hygiene Bulletin.*

* * *

George W. Alger has contributed an article of unusual interest to the *Atlantic Monthly* for April entitled Leisure—For What? The writer believes that the large amount of crime in this country, wholly out of proportion to crime in other civilized countries, the prevalence of the use of habit forming drugs, and our large insanity records, are partly caused by the vastly increased amount of leisure, together with the decrease of pleasure and interest in work, which marks present day industrial conditions.

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Shaw's *Cæsar and Cleopatra,* which opened the Theatre Guild's new playhouse in New York City, is running also in London at the Kingsway Theatre.

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An English producer has made a motion picture play of Alfred Ollivant's famous dog story, *Bob, Son of Battle,* and it is reported to have had a brilliant opening at the Tivoli in London. The stars of the production are two of the greatest sheep dogs of the Cumberland Downs, and the supporting cast of humans is headed by James Carden, Ellen Terry's husband. An American producer has secured the rights for this country and the film will be shown here soon. In this connection we are reminded by Mr. Ollivant's American publishers, Doubleday, Page & Company, that *Bob, Son of Battle* had its greatest success here. About 175,000 copies of the book have been sold in this country since it was first published in 1901.—*New York Times.*

* * *

India, it seems, is fast becoming the favorite source of supply of the monkeys that furnish the glands for the new thyroid treatment. This seems a curious coincidence when we remember that in India the tradition and sentiment of all classes is to protect monkeys from destruction, and that in certain localities and in all the places of pilgrimage monkeys are fed regularly and to kill one is a great crime.

* * *

Flying hospitals have been added to the equipment of the British army in Iraq. Each carries a doctor, a nurse, and several beds for patients, and is driven by a specially silenced Napier engine of one thousand horse power. These flying hospitals will travel a hundred miles an hour from their bases to the scene of skirmishes, and, after treating milder cases, will take the more serious casualties on board and fly with them to the nearest base hospital, with the necessary treatment being supplied enroute.

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The first real international conference on education will be held in Edinburgh from July 20th to 27th of the coming summer. The plan originated in this country two years ago during the National Education Association conference in San Francisco, to which invitations had been issued to various nations to send delegates. These invitations were accepted by the educational organizations of Great Britain, Canada, India, China, Japan, Italy, Czecho-Slovakia, and Greece; and at the San Francisco meeting it was decided to organize a World Federation of Education Associations, which should summon a world conference to meet in 1925.

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Girls employed on a monotonous process in a bleaching factory were given two rest periods of forty-five minutes each during the day. On the advice of an expert, the régime was changed to twenty minutes rest after every eighty minutes of work, with the result that output was increased sixty per cent.—*Industrial Psychology and the Production of Wealth,* by H. D. Harrison.

* * *

In Switzerland in the eighteenth century prostitutes and courtesans were sentenced to the labor of street cleaners and refuse collectors. They worked in squads, supervised by a policeman with a cane. Part of the squad hauled the large wagons about the others cleaned the streets and shovelled the refuse into the cars.—*Aesculape.*

* * *

Pirandello, the Italian playwright, has established in Rome a repertory theatre which will be run for art, not commercial interests. The plays of all countries will be produced, including some of those of George Bernard Shaw, G. K. Chesterton, and Lord Dunsany..

* * *

The *Forum* for April seems largely given up to debates. The discussion pro and con Roman Catholicism, which began in the March number, is continued through an article by John Jay Chapman, who replies to a challenge from Michael Williams, Catholic editor and author, in the March issue, to the opponents of Catholicism to submit a specific bill of complaints against his church. To Mr. Chapman's reply to this challenge, Dr. Frederick Kinsman, formerly Protestant Episcopal Bishop of Delaware, now a Roman Catholic layman, will write an answer for the May issue.

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Another debate in the April *Forum* is on the subject, Is Crime Preventable? between Neil McCullough Clark, whose argument is entitled What's Bred in the Bone, and Walter B. Pitkin, who writes on The Intelligent Criminal. Other articles of interest are What Is Civilization? The Age of Pericles, by Paul Shorey; The Credo of a Naturalist, by Henry Fairfield Osborn; Our Democracy of Bad Manners, by Elizabeth Robins Pennell, and Has America a National Style?, by Johan Bull.

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Among recent Macmillan publications of interest is *Pascal D'Angelo, Son of Italy,* poems written by an Italian immigrant who struggled through starving and bitter suffering and work on the roads to write and sell his book.

Abstracts from Current Literature

ARTHRITIS

Observations on Arthritis.—L. T. Swain (*Journal of Bone and Joint Surgery,* July, 1924) states that arthritis is more than an infection, it is a problem of physiology and chemistry, a problem of foods, assimilation, and excretion. In atrophic arthritis the skin secretions are found to be abnormally acid. Recovery from arthritis is dependent on several factors: the removal of infection where possible, the type of food, assimilation and excretion, the general resistance secured by normal physiology and chemistry. This is aided by the normal physiological use of the body through corrective exercise and better body mechanics.

Age Factor in Hypertrophic Arthritis.—T. A. Willis (*Journal of Bone and Joint Surgery,* April, 1924) says that hypertrophic bone changes represent the reaction of bone and joint structures to the wear and tear of life. They are more pronounced in certain types of individuals and are aggravated by continued local irritation of any character. These changes rarely occur before the thirty-fifth year of age, but are progressive thereafter. They may exist to a marked degree without clinical symptoms, being the result of metabolic changes rather than the cause, their presence does not prohibit relief from such symptoms. The bone changes are permanent. Treatment of the symptoms must be directed toward the removal of all possible sources of continued irritation. These include mechanical strains, focal infections, intoxications, and absorptions.

Attempts to Transmit Rheumatic Fever to Rabbits and Guineapigs.—C. Philip Miller, Jr. (*Journal of Experimental Medicine,* October, 1924) attempted to transmit rheumatic fever to rabbits and guineapigs by injecting them with various materials obtained from patients suffering with this disease. The materials used were whole blood, serum, joint fluid, pleural fluid, throat washings, and tonsil tissue, thus including the materials which might rationally be assumed to contain the virus of the disease during its acute stage. Throat washings and tonsil tissue were chosen because of the frequent association of tonsillitis with rheumatic fever. Twenty-seven rabbits and fourteen guineapigs were used. Transfer inoculations, i. e., from rabbit to rabbit, or guineapig to guineapig, brought the total number of animals used in these experiments to sixty-seven rabbits and forty guineapigs. Only two developed an acute nonbacterial arthritis. No other evidence of successful transmission of the disease was obtained. About half the rabbits and two thirds of the guineapigs showed myocardial lesions consisting of interstitial accumulations of lymphocytes and endothelial cells. Similar lesions were found in control animals.

Rheumatoid Arthritis.—Norman Kletz (*Clinical Journal,* November 5, 1924) says that in acute cases the first essential is rest. The joints should be placed in the position which ensures greatest comfort, being supported, if necessary, by suitable splints. The pain and local inflammation can best be relieved by hot applications such as hot flannel fomentations, if necessary applied over glycerinum belladonnæ. Quinine salicylate in doses of two to five grains three to four times a day is often useful, though in many persons toxic symptoms are rapidly produced. Great relief can usually be obtained by the occasional administration of a powder consisting of four grains of pyramidon, five grains of phenacetine and five grains of aspirin. The activity of the excretory paths must be efficiently maintained, and sleep secured, if necessary by the use of opium preparations, such as Dover's powder, nepenthe, or even morphine hypodermically. This treatment is, of course, largely symptomatic and palliative. The best way to attack the toxemia is by intravenous protein injection. Various proteins have been used, the safest and most effective probably being dead Bacillus coli. The initial dose in the acute stage should be from twelve to fifteen millions. This is diluted to ten c.c. with bacteriologically sterile and chemically accurate normal saline, which should be freshly prepared, and at normal body temperature. An all glass syringe should be used and the material injected slowly into a vein. The author has never known any serious disturbance to occur, and the effect on the joint condition and general constitutional symptoms is often striking. Not infrequently a few injections at weekly intervals appear to limit the condition completely.

A suitable initial dose in subacute or chronic cases is from twenty to twenty-five millions. The injection is usually followed in a few hours by symptoms of discomfort, headache, nausea and even vomiting, with shivering and pyrexia usually about 100° to 101°. These symptoms rarely last for more than twelve hours. Severer reactions are unusual. The injection should be given over a period of several months, at weekly intervals. So long as the dose produces an adequate reaction it does not require to be increased. The results are gratifying. Even in chronic cases, where deformity is extreme and fixation marked, some improvement can be obtained in the direction of increased mobility and relief of pain.

After the acute symptoms have subsided, and in the more chronic cases, confinement to bed is not only useless, but harmful. The patient should be encouraged to move about, and the affected joints kept mobile by means of radiant heat, massage and passive movement. This is absolutely essential in order to maintain functional activity of the joints and prevent the adhesions, and contractures, which are such striking and distressing features of neglected cases. Drug treatment is valuable even apart from the relief of pain. The old fashioned combination of potassium iodide and guaiacol carbonate is of limited value. Improvement sometimes results from collosol iodine and collosol sulphur given in doses of one or two drams in water, thrice daily after food, for alternate weeks. These preparations must be persevered with for long periods. Iodolysin and fibrolysin have been recommended and sometimes appear to be effective.

Surgical Treatment of Osteoarthritis.—C. M. Page (*British Journal of Surgery,* July, 1924) states that the two primary indications for recourse to radical operation are persistent pain, and progressive deformity in relation to the joint affected. There are four procedures, viz., excision of the joint, arthroplasty, erasion of the joint, and synovectomy. The aim of these operations in regard to the final function of the articulation varies considerably. The decision as to which one to employ, as well as the nature of the aftertreatment also vary in respect of different joints.

In the hip joint the choice of operation depends little on the anatomical condition or etiology, but is determined by the age and general condition of the patient. In the young and middleaged the aim is not only to remove pain but also to provide a stable joint, which is effectively obtained by complete erasion of the joint producing an arthrodesis, followed by fixation in plaster of Paris. In elderly feeble patients an arthrodesis should not be attempted, as it is often followed by pain in the lumbar spine and sacroiliac joints. Simple excision of the head of the femur is favored.

The problem of avoiding the secondary development of adduction deformity after operation only arises when a fibrous joint is the result. If firm bony ankylosis is obtained in a good position by means of proper fixation the difficulty does not arise; but it should be remembered that sound bony union is not always obtained, however carefully the operation may be carried out, and that union apparently firm, if due to fibrous tissue, is liable to gradual stretching. In all cases, therefore, of operations of this nature, the two simple mechanical factors above enunciated should receive attention, viz., preservation of the full function of the gluteus medius and minimus and tensor fasciæ femoris, and the preservation of the neck of the femur at as full length as possible.

For the knee a radical cure of osteoarthritis can only be obtained with certainty by arthrodesing the joint. Such a final destructive procedure is only justified in those cases in which pain is severe and persistent, or in which absorption of the bone of the outer condyles has deformed the joint. Synovectomy, when practised on those cases in which the chief and apparently primary change is in the synovial membrane, has given satisfactory results.

The operative technic for hip joint is described through three separate routes, the posterior, the superolateral, and the superoanterior. Of these the first route is discarded as unsatisfactory, the second is the most satisfactory for old

patients on account of its rapidity and the small amount of muscle section required and the third, giving the fullest exposure of the joint, while proving easily workable for children, is not for adults as satisfactory as the supero-external route.

In operating upon the knee establishment of union by fibrous tissue may be counteracted by attention to the following details: The synovial pouch should be dissected out, the bulk of the synovial tissue in the joint being in this way removed. The section of bone should be so planned that vascular cancellous bone is exposed everywhere except at the margins. Close apposition of the cut bone surfaces is usually assured without any special splinting, by pulling the patella down to the level of the tibia and pegging it in position there. The articular cartilage of the patella is previously cut off. The bone is most effectively held by means of a long French nail. This procedure holds the bone surfaces firmly in contact by the tonic pull of the quadriceps muscle and its opponents.

The author concludes his studies with a tabulated report on thirty-four cases of osteoarthritis treated by operation.

Effect of Pressure on Articular Surfaces.—D. B. Phemister (*Annals of Surgery,* October, 1924) offers the following conclusions: In pyogenic arthritis articular cartilage is killed and broken down first at the points of contact and pressure of opposing articular surfaces. In tuberculous arthritis articular cartilage is not killed first, but is protected at the points of contact and pressure of opposing articular surfaces. Cartilage is extensively destroyed first along the free surfaces, where the tuberculous granulations can grow onto and remove it. It usually disappears last in the regions of contact and greatest pressure in the joint, where it is detached and killed by undermining granulations and is then partly eroded by pressure of opposing bony surfaces. Proteolytic ferments derived largely from polymorphonuclear leucocytes assist greatly in the rapid removal of necrotic cartilage in pyogenic arthritis. Proteolytic ferments are absent in tuberculous arthritis, and masses of dead cartilage may persist for months or years, showing few signs of progressive destruction. In pyogenic arthritis the infection rarely invades secondarily the deeper portions of the bone at the points of pressure. In tuberculous arthritis invasion of the bone at the points of pressure is of common occurrence after the articular cartilage has been largely or wholly destroyed. The invasion is frequently on both sides, in which case it may lead to the formation of kissing sequestra at the points of greatest pressure in the joint. Weight extension should be applied during the active period of pyogenic arthritis to lessen the amount of invasion and destruction of articular surfaces at the points of contact and pressure. On the other hand, it would appear that extension for preventing the destruction of articular cartilage in tuberculous arthritis is not indicated. But when articular cartilage has already been destroyed, extension should lessen the tendency to erosion or invasion with sequestration of bone at the points of greatest pressure in the joint.

SURGERY

The Use of Plaster in the Treatment of Fractured Femurs.—W. M. Firor (*Bulletin of the Johns Hopkins Hospital,* December, 1924) undertook a comparison of results obtained by immediate immobilization in plaster of fractures of the shaft of the femur with those obtained by other methods of treatment. One hundred and two patients were treated by reduction and immediate application of a double plaster spica. The cases fell into the following groups: those treated by Buck's extension (average stay in hospital sixty-five days); those treated by overhead extension (fifty days); those treated by open reduction (fifty-seven days); those treated by *immediate* immobilization in plaster; and those treated by *early* immobilization in plaster (nineteen days; for patients over fourteen years, thirty-four days; between seven and fourteen years, fifteen days; and under seven years, fourteen days). The transition from one method to the other is described. The following conclusions are drawn: Immediate immobilization in plaster of fractures of the shaft of the femur does not give satisfactory results in patients over fourteen years of age, whereas in patients between seven and fourteen years, the method gives good results, and in children under seven years, this method gives results which are as good as those obtained by overhead traction. By the use of the method described as early immobilization in plaster, the period of residence in the hospital is greatly reduced.

Arthroplasty Upon the Temporomandibular Joint.—H. McWilliams (*Annals of Surgery,* April, 1924) says that a number of cases of ankylosis recur after operation, and he has classified the causes of these recurrences in three groups as follows: 1. Operations performed in cases that are still in the active stage of arthritis; 2, incomplete operations; 3, cases where either inadequate or no forms of excisors were used. In all cases, it is essential to use an excisor as a postoperative measure. It is advisable to remove most of the condyle. Any pressure made upon the teeth should be upon the canine or those posterior to the canine. It is nonessential to interpose any material between the divided bones. Injury to the occipital frontalis branch of the facial nerve frequently occurs. No touch technic should be employed.

Arthroplasty of the Knee.—W. C. Campbell (*Annals of Surgery,* July, 1924) refutes a statement of a previous report in which he found the results of arthroplasty discouraging, and now asserts that in well selected cases arthroplasty is justifiable and gives an excellent chance of attaining satisfactory motion. He describes the operation and aftertreatment in detail, laying special stress on the intelligent cooperation of the patient as regards the latter. As soon as the operation is completed the limb is placed in a Thomas splint, with a joint at the knee, and a hoop of steel connected just above the anterior to the knee joint. A rope is attached to the centre of the hoop and overhead to a simple wooden frame. A second rope is attached to the lower extremity of the Thomas brace, which passes directly upward to the wooden frame, through a series of pulleys, to the head of the bed, where it is attached. By adjusting these two, any desirable angle may be maintained and by gravity of the leg, under direct control of the patient, passive and active motion instituted. The limb is first placed in the extended position with moderate traction, except in patellofemoral fusion, when flexion is desirable. No motion is instituted until local reaction has subsided, which requires about eight or ten days. Active motion is encouraged with special attention to the development of function in the quadriceps. Passive motion is carried out by the patient, who is given the end of the rope, which is detached from the head of the bed, and by gravity of the leg flexion is made. The subject soon finds that considerable motion is possible without pain. The splint is removed in about six weeks, depending on the stability of the joint, and a simple overhead sling, with block and tackle, substituted, when walking on crutches is permitted. Weightbearing is gradually increased with care to avoid reaction. In resistent cases brisement forcé is of value, if cautiously employed, under nitrous monoxide, with full extension and only ten degrees increase in flexion on each occasion. The value of physiotherapy should not be underestimated, though by no means essential to success, if the measures above described are closely followed by the patient. Total disability is expected from two to three months, partial disability for six months, depending upon the occupation of the individual. Complete extension is essential; sixty to ninety degrees flexion gives the best functional results and a member which can be used for all practical purposes.

Surgery of Knee Joint.—P. H. Kreuscher (*Annals of Surgery,* July, 1924) states that the management of all knee joint injuries resolves itself into four distinct equations.

1. A proper diagnosis of the lesion made from the history of the case and physical and x ray examinations. A study of the mechanism of the accident and a thorough knowledge of the anatomy of the tissues involved are necessary to enable the surgeon to make his decision. The diagnosis by x ray should be made only from a stereoscopic picture.

2. The surgical procedure involves a careful reapposition of injured tissue whether it be osseous, cartilaginous or tendinous and if this is not feasible, a removal of that portion which cannot be utilized or is foreign to the joint and if necessary a substitution of bone or fibrous tissue from some other part of the body.

3. Operative measures upon a joint must be carried out with the strictest aseptic technic and at such time when nature's walling off or cofferdaming is complete. There is no longer any reasonable excuse for introducing into the joint the operator's finger, any instrument, appliance or sponge which is not absolutely sterile. The joint tissue is

as sensitive and as unprotected against infection as the eye and reacts badly to excessive manipulation or trauma.

4. The after care requires the use of such appliances as are necessary to hold the tissues in position. Active and passive motion must be sufficiently early to avoid excessive adhesions and not so late as to permit periarticular fixations to form. The application of physiotherapeutic measures, especially diathermy and heliotherapy, must be utilized to the fullest extent.

Surgery of Knee Joint.—N. Allison (*Surgery, Gynecology and Obstetrics,* October, 1924) points out the following facts: In many clinical conditions, a high percentage of disabled knees may be returned to normal knee joint function by appropriate surgical intervention. In certain disease processes, notably tuberculosis, operation upon the knee offers the one sure method of cure. Here the operation should have for its object the establishment of ankylosis. Until such time as the treatment of tuberculosis by heliotherapy has been perfected and made practical, this would seem to be the better position to hold. In certain disease processes, notably the acute infections of the knee, operations to clean the joint cavity, or to establish drainage, hold the only promise of conservation of knee joint function. Functional use of the lower extremity may be well carried out with a stiff, strong, weightbearing knee. Functional use of the lower extremity is inhibited or lost if the knee is insecure, painful, or partially functioning. The dangers that come with an insecure knee are not insignificant. The menace that shadows the life of an individual with a tuberculous knee is very real. It is possible by surgical measures to restore the lost function to a knee joint. It is also possible by surgery to aid nature in healing the diseased knee.

Habitual Dislocation of Patella.—W. E. Gallie and A. B. Lemesurier (*Journal of Bone and Joint Surgery,* July, 1924) offer the following operative technic as one which obtains perfect functional results and bars recurrence. It is based on the principle of anchoring the patella in place regardless of the original cause of the dislocation or of any anatomical peculiarities that may be present. It consists of tethering the patella by a strand of tendon or fascia to the internal condyle of the femur at the point which forms the centre of the circle through the arc of which the patella moves on flexion and extension of the knee. Transplants of tendon, when not too thick, and transplants of fascia live indefinitely and retain their characteristic structure and strength. It is only necessary, therefore, to make certain of solid union of the tendon or fascia to both the patella and the condyle to obtain the desired result.

The technic of operation varies with the force required to hold the patella in place. When such force is very great a thick piece of the tendo Achilles is used. For the ordinary type of habitual dislocation, however, a very moderate amount of force applied in the right direction is sufficient, i. e., the fascia lata.

The tethering of the patella is accomplished through three small incisions, one on each side of the patella and one over the most prominent point of the internal condyle. Two transverse holes are drilled through the patella about half an inch apart and two slightly larger holes are bored in the internal condyle as in the operation already described. A strip of fascia lata, ten inches long and half an inch wide, is then obtained through an incision on the outer side of the thigh and thoroughly scraped free of areolar tissue. A stout ligature is tied to each end to facilitate insertion. This strip is then passed through the holes in the patella so as to leave a loop at the outer side of the bone. The free ends are then drawn through a subcutaneous tunnel to the incision over the internal condyle. Here they are passed in opposite directions through the hole in the internal condyle so that they overlap each other both in the tunnel in the bone and an inch or more beyond it. The fascia is then drawn taut and the loop is completed by careful suturing with chromicized catgut. By this means the patella is tethered to the internal condyle by a loop of fascia which not only heals to itself in the portion which is overlapped but also to the bones through which it passes. In a few weeks the union is so solid that all possibility of a recurrence of the dislocation is removed.

The advantages which we see in the operation are several. In the first place it is simple, as the only incision of any size is that through which the strip of fascia is obtained. The gap left in the fascia lata is sutured and invariably heals without leaving symptoms or disability. There is none of the risk which attends osteotomy of the femur or any operation which necessitates the opening of the knee joint. The fixation is mechanically sound, as it is obtained by means of a band of very strong material which we know will remain permanently in place and retain its strength and form, and which is so placed that it will exert the necessary pull on the patella in the right direction in all positions of the joint. Finally, the operation is applicable to all cases of recurrent dislocation of the patella and can be relied upon to prevent outward displacement, no matter what the predisposing cause.

Astragalectomy.—W. R. MacAusland and A. R. MacAusland (*Annals of Surgery,* December, 1924) accept this as the operation of choice on account of the many good functional and cosmetic results obtained if it is properly performed. They emphasize the following points in the technic: Correct all existing deformities before open operation. Astragalectomy may be done with or without tendon transplantation, tendon fixation of the peroneals or transplantation through the Achilles and resuture, with strong displacement of the foot backward. Proper aftercare should be followed by the operator and not by untrained assistants. Recurrent deformity is due to improper postoperative care. Lack of posterior displacement is due to careless or improper operative technic, such as failure to remove head of astragalus.

Metal Pry Pin in Fractures.—J. S. Welch (*Surgery, Gynecology and Obstetrics,* December, 1924) describes a metal pry pin procedure useful in the reduction and control of fractures. Following are its points of value as enumerated by the author.

1. The reduction of fragments occurs under the more favorable fluoroscopic observation, rather than the method of taking röntgenograms before and after reduction.
2. The principles are simple.
3. The danger to already damaged soft tissue about the fragments, by too vigorous manipulation during attempted reduction in difficult cases is greatly lessened.
4. The feature of retention of fragments is most helpful in selected cases.
5. Considering the method an open operation, it reduces the same to the minimum risk as such.
6. The use of the pry pin in compound fractures is not necessarily contraindicated. The pin gives the added advantage of drainage.
7. No foreign body remains after ten to fourteen days, and no secondary operation is required.
8. No complications creditable to the pin per se have yet occurred.
9. Its limitations appear in the largest bones with strong contracting muscles, and where soft tissue intervenes between fragments, and where large vessels are too near, especially with preexisting hemorrhage of importance.

Foreign Bodies in Fractures.—E. D. Martin (*International Journal of Medicine and Surgery,* July, 1924) presents an operative technic for fractures of the neck of the femur, whose principle is the fixation of the head of the bone to the femur, rather than the femur to the head, at the same time allowing movement within a small radius, and yet not separating or mobilizing the fragments.

A radiograph is taken outlining the fracture, the nearer the trochanter the better the prognosis. An incision is then made over the prochanteric eminence, about six inches in length, the bone exposed and the finger passed over the trochanter, locating the neck and head; a hole the size of a No. 6, three and one half inch wood screw is drilled through the bone to the line of fracture. An assistant then pulls on the limb until both internal malleoli are in line, inverts the foot slightly and holds it in this position until the screws are inserted. A screw is then introduced and directed as far as possible in the line indicated by the finger; another picture is taken, and if this screw is found to be properly placed, the second is inserted about one inch below and in the same direction, sufficient force being applied to bring the fragments in close contact. You can easily see how readily this is done. The shaft of the screw is driven into the distal fragment; this acting as a nut, the opposing head or fragments are drawn together and in this way the two are closely and firmly held. This done, the head of the femur is now securely fastened to the shaft through the trochanter. The wound is closed with a small drain if the

patient is fat, and all that is now necessary is to place the limb in a Hodgen's splint or hammock until the wound heals, or even longer, if deemed advisable. At the end of four weeks the patient is allowed the freedom of the bed until such time as it is thought safe to allow the use of a roller chair or crutches.

The technic, if carried out as described, will give the results claimed in any case where the condition of the patient is such as to insure osteogenesis.

ANESTHESIA

Ether Anesthesia.—Ethel Ronzoni, Irene Koechig, and Emily P. Eaton (*Journal of Biological Chemistry*, September, 1924) state the following conclusions from their experimental work on the role of lactic acid in the acidosis of ether anesthesia: Accumulation of lactic acid accounts in large part for the acidosis of ether anesthesia. Its increase is independent of CO_2 tension and produces the changes in pH rather than being itself controlled by pH as stated by Anrep and Cannan. Decreased oxygen supply to tissues does not account for its production. The source of lactic acid seems to be the muscle tissues. Production of lactic acid in the muscle, together with loss of phosphate from the muscle (Stehle and Bourne), during anesthesia, points to a breakdown of some hexose phosphate such as Embden's lactacidogen.

Acidosis of Operative Anesthesia.—Alfred E. Koehler (*Journal of Biological Chemistry*, December, 1924) reports the changes observed in the acid-base balance during ether anesthesia induced by the closed cone method and operation. In all cases there was an acidosis ranging from blood pH 7.37 to 7.09. The available alkali of the blood, as measured by the total CO_2, decreased, but usually only slightly, and not at all comparable to the drop in pH had the latter been caused by nonvolatile acids. With the open drop method there was an increase in CO_2 tension of the venous blood in all cases, though the increased tension was very much greater in the closed cone than in the open drop method. This probably accounts for the milder acidosis in the cases done with the latter method.

Alleged Synergism of Magnesium Sulphate and Morphine When Injected Prior to the Induction of Anesthesia by the Ether-Oil Colonic Method.—Harry Beckman (*Journal of Laboratory and Clinical Medicine*, December, 1924) in view of the paucity of experimental data on which to base a belief in the synergism of magnesium sulphate and morphine, has conducted a series of experiments on dogs with the following results: one oz. of a mixture of seventy-five per cent. ether and twenty-five per cent. olive oil to twenty pounds of body weight, introduced into the colon of dogs one hour after the subcutaneous injection of one quarter c.c. of a four per cent. solution of morphine sulphate to the kilo of body weight, is effective in inducing safe and satisfactory surgical anesthesia and in maintaining it for a little more than one hour. One ounce of a mixture of seventy-five per cent. ether and twenty-five per cent. olive oil to forty pounds body weight, introduced into the colon of dogs one hour after the subcutaneous injection of one quarter c.c. of a four per cent. solution of morphine sulphate to the kilo of body weight and two c.c. of a fifty per cent. solution of magnesium sulphate, is not effective in inducing satisfactory surgical anesthesia. The subcutaneous injection of two c.c. of a fifty per cent. solution of magnesium sulphate at the same time that one quarter c.c. of a four per cent. morphine sulphate solution to the kilo of body weight is injected in dogs, when these injections are followed after one hour by the introduction into the colon of one ounce of a mixture of seventy-five per cent. ether and twenty-five per cent. olive oil to forty pounds of body weight, gives rise to undesirable respiratory symptoms and a general depression, which usually lasts two days. These symptoms are directly referable to the magnesium sulphate, because they do not arise when the salt is omitted, the other conditions being the same.

Splanchnic Anesthesia.—Of the three original methods—Wendling's, Braun's, and Kappis's—G. Labat (*Annals of Surgery*, August, 1924) recommends the Kappis technic with modifications. The best results are obtained when the solution is deposited between the semilunar ganglia and the renal pedicles. Variations exist in the inclination of the twelfth rib on the vertebral column which are responsible for a certain number of failures. These failures can be reduced to a minimum by applying the coefficient of correction of the costovertebral angle, that is puncturing on the lower border of the twelfth rib opposite the upper extremity of the first lumbar spinous process. It is perfectly safe to approach the splanchnic area from the back. By keeping close contact with the vertebral column and following the technic described for that route it is impossible to make an intraspinal or an intravenous injection. The concentration of the solution can be advantageously reduced from one per cent. to one half per cent.

Local Anesthesia of Abdominal Sympathetic System.—R. E. Farr (*Surgery, Gynecology and Obstetrics*, September, 1924) finds that local anesthesia possesses many advantages when applied to intraabdominal surgery. Many of the objections to its use are based upon its improper application. Anesthesia methods should be simplified as much as possible and the surgeon who essays the use of local anesthesia should possess appropriate equipment and sufficient training to enable him to administer his own anesthetic. The term "local anesthesia operation" should be used to signify only operations which are carried to their completion without curtailment and without pain or the addition of other drugs. With an exhibition of the appropriate technic, complete anesthesia may be painlessly established for the performance of a vast majority of abdominal operations. And finally, the consistent use of local anesthesia in this field demands adequate equipment and an adherence to fundamental principles, the most important of which are the psychic preparation of the patient, a painless induction of the anesthesia of the abdominal wall, elastic retraction, exposure which allows the establishment of intraperitoneal anesthesia and a surgical technic compatible with the best interests of the patient.

Sacral Nerve Block Anesthesia.—W. R. Meeker and A. J. Scholl (*Annals of Surgery*, November, 1924), have made extensive studies in this field, from which they ascertain that anesthesia of the sacral nerves is entirely satisfactory for most operations that are to be carried out in the field supplied by the sacral nerves. It entails practically no immediate or late risk for the patient, and has been proved efficient and satisfactory. A knowledge of the posterior surfaces of both normal and abnormal sacrums and contiguous bony prominences is necessary in order to employ sacral anesthesia successfully. Certain variations of the structure of the sacrum may influence the case of induction or the result of the anesthetic. The size of the sacral hiatus is variable. The normal sacrum is made up of five vertebra. The number of foramina to be injected varies with the number of segments. Palpation of the bony prominences gives the most accurate knowledge of the location of the sacral hiatus and foramina. The posterosuperior iliac spines are the most readily accessible bony prominences and they usually bear a constant relationship to lateral foramina.

In certain cases in which the operation is to be performed in a field supplied by the lower sacral nerves, a single injection of novocaine in the sacral hiatus is sufficient. In the majority of cases the lateral foramina and the contained nerves, as well as the sacral hiatus, were injected, inducing immediate anesthesia which is satisfactory in practically all cases. A one per cent. solution of novocaine, to which was added a small amount of epinephrin, was employed. Our experience has not indicated that the combination of other salts with the novocaine results in a more satisfactory anesthesia.

Sacral injections for therapeutic purposes were carried out in the treatment of nervous conditions, and a proportion of cases of sciatica were definitely improved, but they were of very little practical value in the treatment of urinary disorders such as incontinence and enuresis.

In obstetrical cases sacral anesthesia has proved satisfactory in reducing the perineal pain incident to the passage of the child, and it also permits a satisfactory relaxation of the perineal muscles, which greatly reduces the tendency to tear. Obstetrical operations and manipulations may be painlessly performed under this anesthesia.

Anesthesia of the sacral nerves has proved satisfactory for most surgical procedures on the pelvic floor and viscera. It is especially satisfactory in urologic cases. The mortality following operations on the bladder, prostate and rectum is markedly reduced in cases in which sacral anesthesia is employed. In urological surgery many patients are encountered having a reduced renal function. Sacral anesthesia, which in most cases does not increase the work of the kidneys, is especially desirable.

Cystoscopic examinations and urethral and bladder manipulations may be readily carried out under sacral anesthesia. Small contracted, infected and malignant bladders may be dilated sufficiently to make a complete, unhurried examination without discomfort to the patient. A single injection in the hiatus sacralis is sufficient for the majority of cystoscopic examinations and manipulations.

Undesirable complications and sequelæ are exceedingly rare following sacral anesthesia. In no case did any permanent or lasting trouble develop. Occasionally in debilitated patients slight toxic symptoms followed the injection of the novocaine epinephrin solution, but these readily passed off; in the majority of cases the patient was perfectly well following operation and had no ill effects from the anesthetic.

Sacral Anesthesia.—L. E. Moon (*American Journal of Surgery,* November, 1924) is convinced that sacral anesthesia is the method of choice for rectal operations when performed in a hospital, for the following reasons: First, the convalescent period is shortened; second, the number of postoperative complications is lessened; third, there are no anesthetic and postanesthetic dangers and complications; fourth, the depth and completeness of the anesthesia makes the operative procedure less difficult.

Anesthesia in Renal and Prostatic Surgery.—W. S. Pugh (*International Journal of Medicine and Surgery,* October, 1924) makes a study of regional anesthesia, with the following conclusions: 1, Regional anesthesia is indicated in all operations on the kidney, bladder and prostate. 2. It reduces shock as well as urinary and cardiac disturbances to a minimum. 3. With a little practice all of the technics are readily acquired. 4. Suprapubic operations may be done by one of several technics. 5. Perineal prostatectomy is best accomplished by a combined sacral and parasacral anesthesia. 6. In renal operations, paravertebral anesthesia is the method of choice. 7. Difficult cystoscopies and intravesical technics may be readily done under sacral anesthesia.

DIABETES

Hemosiderosis: a Case of Bronze Diabetes with Endocrine Disturbances.—P. L. Marsh (*Endocrinology,* November, 1924) gives a detailed report of a patient, observed for three months preceding death, who presented two distinct syndromes, bronze diabetes and eunuchoidism. The course of the former disease was striking and its progress, as evidenced by failing carbohydrate tolerance, was rapid. One variety only of pigment, hemosiderin, was found under the microscope, very abundant in the liver, heart, stomach, kidneys, bronchi, pituitary, thymus, and adrenal glands, testes, and skin. The question whether the disturbance was primarily a pluriglandular one could not be decided from the data at hand.

The Treatment of Diabetes.—Elliott P. Joslin (*Canadian Medical Association Journal,* September, 1924) in addition to a discussion of insulin gives the following directions for the treatment of the feet of diabetics over forty years of age in order to avoid gangrene, which, he says, with local infections, caused half the deaths from diabetes last year in the larger hospitals of Boston.

Hygiene of the Feet

1. Wash feet daily with soap and water. Dry thoroughly, especially between toes, using pressure rather than vigorous rubbing.

2. When thoroughly dry, rub well with hydrous lanolin as often as necessary to keep skin soft, supple and free from scales and dryness, but not enough to render feet tender. If nails are brittle and dry, soften by soaking in warm water half an hour each night and apply lanolin generously under and about nails and bandage loosely. Clean nails with orangewood sticks. Cut the nails only in a good light and after a bath, when the feet are very clean. Cut the nails straight across to avoid injury to the toes. If you go to a chiropodist, tell him you have diabetes.

3. Wear shoes which are large, broad and flexible and do not bind or rub. Wear new shoes half an hour only on the first day and increase one hour daily.

4. If the feet become too soft and tender, rub once a day with alcohol.

Treatment of Corns and Callosities

1. Wear shoes which cause no pressure. The Japanese seldom have gangrene. Beware of nails and torn linings in old shoes and wear new shoes for the first time in the evening. It is wise to have two pairs of shoes which differ slightly from one another and to wear them on successive days.

2. Soak foot in warm, soapy water; dry and rub with gauze, or file off dead skin. A corn may be painted with the following mixture: salicylic acid, one drachm; collodion, one ounce. Repeat for four nights; then, after soaking in warm water, the corn will come off easily.

3. Do not cut corns or callosities.

4. Wear pad to distribute pressure if necessary.

Circulatory Aids

1. Exercises. Bend the foot down and up as far as it will go six times. Describe a circle to the left with the foot six times and then to the right. Repeat morning, noon, and night. Rising on tiptoes twenty times is an excellent exercise.

2. If subject to chilblains, wash feet daily in warm water, dry carefully, and powder lightly with borated talcum powder, wear woollen stockings and avoid extremes of temperature.

3. Massage with lanolin.

4. Buerger gravity—hyperemia method for bed patients gives excellent results, as does the violet ray in indolent sores.

Treatment of Abrasions of the Skin

1. Insignificant injuries in the diabetic may result very seriously. Therefore, proper first aid treatment is of the utmost importance. Consult your physician.

2. Avoid strong irritating antiseptics, such as sulphonaphthol and iodine.

3. As soon as possible after injury certain surgeons recommend the application of sterile gauze saturated with medicated alcohol. Keep wet for one hour by pouring on more alcohol. Sterile gauze in sealed packets may be purchased at drug stores. Purchase a tube of boric acid ointment. Later keep wound covered with boric acid ointment on sterile gauze. Change daily until healed.

4. Elevate and, as much as possible until recovery, avoid using the foot.

5. Consult your doctor for any redness, pain, swelling, or other evidence of inflammation.

The Use of Intarvin Fat—Glyceryl Margarate—in Diabetes Mellitus.—Charles S. Keefer, William A. Perlzweig, and William S. McCann (*Bulletin of the Johns Hopkins Hospital,* September, 1924) report four cases of diabetes in which intarvin was substituted for the fat of the diet. One patient received intarvin with his diet for four days, and in the other cases only one day periods were used. In these patients there was a very definite diminution in the amount of acetone bodies excreted in the urine during the day on which the intarvin was fed, with the exception of one patient in whom there was a rise of acetone body excretion. This diminution was followed in two cases by a slight rise of acetone body excretion when the natural fats of the diet were resumed. In two cases this decreased acetone body excretion continued even after the resumption of the diet containing ordinary fats. In view of the results reported, it is quite probable, but not certain, that intarvin gives rise to less ketosis than does an equivalent amount of ordinary fat. From a practical point of view, the use of intarvin fat in diabetes is limited, because it is intensely disagreeable for the patient to whom it is given as the chief source of the fat.

Pitfalls in the Diagnosis of Diabetes.—Henry J. John (*American Journal of the Medical Sciences,* January, 1925) says that the finding of glycosuria alone is not a sufficient basis for the diagnosis of diabetes. If glycosuria is innocent then it is due to a low renal threshold or to an overflow of glucose as the result of a very heavy carbohydrate meal. On the other hand, if glycosuria is due to diabetes it is not innocent and therefore the presence of glycosuria should be considered an indication for the institution of such procedures as will determine its cause in the individual case. All that is required in such a case is to instruct the patient to eat a heavy carbohydrate meal and to present himself at the office exactly three hours thereafter for a blood sugar estimation and urine examination. If the individual is normal, there will be no hyperglycemia because, in a normal individual whose tolerance for carbohydrates is unimpaired, the blood sugar content will be normal or subnormal. On the other hand if at the end of the three hour postprandial

period the blood sugar is above the normal level, the patient is definitely a diabetic whether or not there be sugar in the urine. Thus, for diagnostic purposes, the three hour postprandial blood sugar estimation is of much more importance than the fasting blood sugar estimation.

The length of time since the last meal should always be considered when blood is taken for a general estimation since the blood sugar content varies during the day and a postprandial rise may be misinterpreted as a result. In the continued study of a case it is essential that the blood be taken always at the same periods with reference to meals, the test always beginning with a fascinating blood sugar estimation.

As has already been emphasized a fasting blood sugar estimation alone is not of diagnostic value, since in even a severe case of diabetes the blood sugar content may be normal if the patient is on a proper diet. Due to this very fact some cases have been misinterpreted in laboratories, where, since the fasting blood sugar was found to be normal and glycosuria not present, the patients were told that they did not have diabetes. As a result these patients returned a few months later in such an advanced stage of diabetes that the administration of insulin was required.

Paget's Osteitis Deformans with Diabetes Insipidus and Nervous and Endocrine Disturbances.—R. Schön (*Münchener medizinische Wochenschrift,* December 5, 1924) believes latent Paget's disease much more common than it has been thought to be, and ascribes to it many symptoms of nervous disorder capable of production by the mechanical effects of increased pressure on the part of a thickened skull. In the case reported headache, vertigo, and floating particles before the eyes first developed; then exophthalmos and diabetes insipidus appeared, the gait became unsteady, and a pituitary tumor was diagnosed by means of the x ray. Irregular menstruation indicated an involvement of the ovaries. Only in this later period did marked bony enlargement become manifest and rarefaction of numerous areas in the skull and long bones were detected.

Proteotherapy in Diabetes Mellitus.—M. Grossmann and J. Sandor (*Wiener klinische Wochenschrift,* August 28, 1924) report marked improvement of the metabolism in a number of cases of diabetes with the use of caseosan, usually given for a few days, even when insulin had no effect. Certain associated symptoms, especially neuritis, are favorably influenced. The excretion of acetone usually remains unaffected. The reduction of the glycosuria and of the blood sugar content is an indication for the suitability of the case for this type of treatment. The cases with nondiabetic complications are aggravated. Some are not influenced by the caseosan. Therefore proteotherapy has decided advantages in certain cases, which must be carefully tested as to their suitability for this treatment.

The Variability in Rabbits Used for the Assay of Insulin.—J. P. Rose and H. W. Acton (*Indian Medical Gazette,* July, 1924) describe their experiments and say: "In the different rabbits tested by insulin there was a variation in the reduction of the amount of blood sugar after the same dose. This variability is closely correlated to the color of the animal tested; the albinos are the least affected and the black and white have convulsive symptoms due to the hypoglycemia. Small doses of adrenalin inhibit the action of insulin by causing hyperglycemia. The adrenalin content can be markedly increased by fright and exercise. The color variations are closely associated with the adrenalin content in the blood of these animals."

Reduction of Human Blood Sugar by Means of Insulin.—S. H. Kahn (*Boston Medical and Surgical Journal,* July 24, 1924) says that the reduction of blood sugar in normal individuals at rest to the unit of insulin is strikingly similar. The blood sugar level is a factor in the amount of blood sugar reduction. The weight probably governs the duration of the effect of insulin. The variations in reduction of blood sugar in diabetics may be accounted for to a great extent by the amount of insulin used per kilo of body weight, by the blood sugar level, and the amount of available body sugar. Insulin produces a greater fall in the blood sugar of diabetics than in normals; the least fall in blood sugar of diebtics takes place in the patients whose blood sugar level approaches the normal, and may be as low as normal. The least reduction of blood sugar to the unit of insulin takes place in diabetic coma; the next lowest in precoma cases. The power of the body to restore the alkali reserve, marked cardiac failure and toxic goitres probably influence the action of insulin.

Effect of Insulin Upon the Reducing Substance in the Cerebrospinal Fluid of Normal Rabbits.—Michio Kasahara and Eikichi Uetani (*Journal of Biological Chemistry,* March, 1924) studied the effect of insulin on the spinal fluid sugar of normal rabbits. They found that after subcutaneous administration of insulin there was a decrease in the concentration of the reducing substance in the spinal fluid. There is probably in the cerebrospinal fluid and blood always some parallelism of the content of the reducing substance, and therefore its concentration in the fluid varies directly with the degree of glycemia.

Clinical Assaying of Insulin and the Insulin Requirement.—Constant assaying of numerous lots of insulin as received from the manufacturers convinced R. M. Wilder (*Endocrinology,* September, 1924) that the uniform results obtained are evidence of a direct action of insulin on glucose, a definite chemical interaction being manifest between insulin and glucose. He found that the glucose equivalent of insulin, however, may be altered by high protein and high carbohydrate diets, and the insulin requirement of the individual may be diminished by starvation. The glucose equivalent of insulin is also depressed by acute complications, especially by infections.

Studies of the Effect of Exercises in Diabetes.—Robert O. Loebel, David P. Barr, Edward Tolstoi, and Harold E. Himwich (*Journal of Biological Chemistry,* August, 1924) used phlorhizinized rabbits to study the response to exercise during the completely diabetic state. The investigation was undertaken to ascertain whether an animal which has lost the power of oxidizing carbohydrate retains the ability to form lactic acid, and also to determine if lactic acid may be formed in a completely phlorhizinized animal whose glycogen stores are minimal. It was necessary to use artificial means of causing vigorous muscular contractions, and strychnine was employed for this purpose. It was found that lactic acid may be formed in an animal which is unable to oxidize carbohydrate, and it also appears in a completely phlorhizinized animal whose glycogen stores have been reduced to a minimum.

Favorable Effects from the Alimentary Administration of Insulin.—R. Murlin, C. C. Sutter, R. S. Allen, and H. A. Piper report (*Endocrinology,* May, 1924) on experiments carried out in the endeavor to find a satisfactory method for the oral administration of insulin. They satisfied themselves that insulin in crude solution containing 0.1 per cent. of hydrochloric acid, when placed directly in the duodenum of the diabetic patient, can be absorbed and can function to cause the utilization of sugar. Also that insulin, in enteric coated tablets containing a substance designed to delay temporarily the destructive action of trypsin, can survive passage through the stomach in some patients, can be absorbed in the intestine, and can operate to improve the diabetic condition very materially.

Low Nitrogen Metabolism with Low Carbohydrate Diet in Diabetes.—Karl Petren (*Journal of Biological Chemistry,* September, 1924) has for years been treating grave diabetes with a diet very low in protein, poor also in carbohydrate (especially no bread or other farinaceous foods) but higher in fat. His tables show that in diabetic persons with a carbohydrate intake much below forty gm. a day, with liberal amounts of fat, a low nitrogen metabolism may be obtained over long periods. The results indicate that the sparing influence of fat on the quantity of metabolized nitrogen is greater than has been assumed. By a combination of the low protein, low carbohydrate, and high fat diets a lower nitrogen metabolism than hitherto reported by physiologists has been secured, and this even on a low caloric intake.

Eye Conditions in Diabetes as Influenced by Insulin.—Grafe (*Medizinische Klinik,* July 13, 1924) says the effect of insulin on the eye is directly the opposite of that of adrenalin. When coma renders the reaction of the organ sluggish or imperceptible, insulin causes it to become normal in a day or two by increasing the tension. Retinal lipemia disappears rapidly under its influence. Refractive and accommodative disturbances run a shorter course and are less likely to return after its administration. A thickened lens may decrease to normal size, if the cataract is diabetic and of recent growth. When operation is performed on diabetic cataract, it is far more likely to be successful when insulin has been given. Diabetic retinitis, on the contrary, shows no improvement under insulin treatment.

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Medicolegal Notes.

DUTY TO INFORM PATIENT OF NECESSARY PROCEDURE

The Georgia Court of Appeals holds, Bryson v. Aven, 124 S. E., 553, that the relation of patient and physician is a confidential one, and where in curetting a womb it becomes necessary, in order to effect a successful result, to insert a pessary, a duty devolves upon the physician to inform the patient within a reasonable time of the use of the pessary, and direct her as to when it should be removed. A failure so to inform her is held to be a fraud on her, and if injury result therefrom to the patient, a cause of action accrues at the time of the discovery of the fraud, or when, by the exercise of due care, the fraud might have been discovered by her, and not from the date of the injury, or the date of the operation. In such a case it was held that the operation and the insertion of the pessary were not an invasion of a right, and no cause of action could accrue until the discovery of the fraud and the resulting injury. Where suit was filed by the patient against a physician more than two years after the operation, but within only about three months after the discovery of the alleged fraud, and where it was alleged in the petition that an injury to the plaintiff resulted in a miscarriage on account of the failure of the physician to inform her of the presence of the pessary in the womb, and as to when it should be removed, it was held that a cause of action was set out, and the suit was not barred by the statute of limitations.

RIGHT TO MEMBERSHIP IN MEDICAL SOCIETY

The West Virginia Supreme Court of Appeals holds, State v. Monongalia County Medical Soc., 124 S. E., 826, that one cannot by mandamus compel a medical society to restore him to membership therein, when the proof shows that he was not elected to membership in the manner prescribed by the societys by-laws, though the president and secretary of the society erroneously announced his election.

VALIDITY OF CONTRACTS CONDITIONED ON CURE

An action by a surgeon to recover the sum of $1,000 alleged to be the balance due him upon a contract with the defendant for operating upon the latter's sister was defended on the ground that the defendant had not made the contract sued on, and that the contract he did make with the plaintiff was conditioned upon the operation upon his sister being successful, and that she died as the result of it within a few days. He had already paid the plaintiff $500 of his fee, and he made his answer a cross complaint to recover this sum from the plaintiff. The plaintiff denied that the contract was conditional. From a judgment for defendant the plaintiff appealed.

The Arkansas Supreme Court says, in reversing this judgment and remanding the case for a new trial, Guild v. Whitlow, 257 S. W. 383, that special contracts with physicians or surgeons upon the principle of "no cure no pay" are generally held valid. They are conditional contracts, and there seems to be no reason why a physician may not enter into a contract whereby his right to compensation may be dependent upon his curing the patient entirely by treatment or by operating upon him.

PRIVILEGED COMMUNICATIONS RULE HELD NOT TO APPLY TO PUBLIC RECORDS

In a prosecution for murder the certified copy of a certificate of deceased's death was held by the Iowa Supreme Court to be admissible against the contention that it violated the rule protecting privileged communications, that rule having no application to public records, State v. Flory (Iowa), 199 N. W., 303. On this question the decisions of the various states are not harmonious.

PUNITIVE DAMAGES FOR GROSS NEGLIGENCE OR RECKLESSNESS

The Oregon Supreme Court holds Rennewanz v. Dean, 229 Pac., 372, that no only will punitive damages be allowed in an action where the evidence was sufficient to show a malicious desire on the part of the defendant to inflict injury upon the plaintiff, but the authorities are numerous that punitive damages will also be allowed where the defendant's conduct is reckless, as if he knew the danger impending to the plaintiff, but proceeded with manifest indifference to the result. Likewise such damages are awarded where the defendant is grossly negligent. It is held to be for the court to determine whether there is evidence to go to the jury upon the subject; and it is for the jury to determine the fact from the evidence, and its exclusive province to assess punitive damages if there is any actual damage to which the exemplary damages may be added.

Where there was testimony that after being treated by injections for hemorrhoidal tumors at defendant's office the plaintiff experienced a severe hemorrhage which compelled him, after being given some hypodermic injections and some pills, to lie on a couch in the defendant's office for more than 24 hours during which no steps were taken to arrest the hemorrhage, until he was too weak to stand alone, and so wasted by loss of blood that his wife hardly knew him, and he remained for about a month in a hospital, requiring surgical operations, it was held that it was for the jury to say whether the defendant's treatment of plaintiff was reckless or even grossly negligent.

ACTION FOR MALPRACTICE HELD BARRED BY RELEASE OF DISPUTED CLAIMS FOR INJURIES

The Illinois Appellate Court holds, Guth v. Vaughan, 231 Ill. App., 143, that where a physician was sued for malpractice in setting plaintiff's leg, broken in an automobile collision, the action was barred by a release given by the plaintiff to the owner of the automobile acknowledging a sum of money received "to be in full accord and satisfaction of a disputed claim growing out of bodily injuries" sustained by him and releasing and discharging such owner "from any and all actions, cause or causes of actions, claims and demands, for, upon, or by reason of any damage, loss, injury or suffering" which he had suffered or would suffer "in consequence of such accident and injury," since he could not recover again for the same injury or its aggravation by malpractice.

CHARITABLE HOSPITAL NOT LIABLE TO PAY PATIENT FOR NEGLIGENCE OF NURSE

The Indiana Supreme Court holds, St. Vincent's Hospital v. Stine, 144 N. E., 537, that a hospital, organized under Acts 1881, c. 113 (Rev. St., 1881, §3502), without corporate stock, paying no dividends and not operated for profit, the money received from pay patients going into the common fund available to pay the expenses of both destitute and pay patients, is not liable for the negligence of a nurse to a pay patient, unless it appears that the corporation was negligent in selecting the nurse. The court finds that this is in accordance with the rule followed by at least twenty of the states and in the federal courts, and that in only three states, Rhode Island, Alabama and Minnesota, have the courts held the contrary. In Rhode Island, after the decision holding such corporations liable, the Legislature changed the rule by statute, leaving only two states holding the contrary doctrine.

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Chronic Carbon Monoxide Poisoning an Increasing Danger to Municipalities from Automobile Traffic

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The subject of intoxication from carbon monoxide is not new, as is attested by the ever increasing literature on the subject, not only in medical journals, but in the daily press, and in popular and scientific magazines. A valuable monograph, which covers the subject in the fullest detail, appeared in Germany in 1920 by Prof. Louis Lewin, (1) and little new can be added to what has long been known of the clinical symptoms and pathology of the various types of poisoning which the gas produces in the human race. Lewin found a reference to the danger from the gas in Aristotle's writings in which he says, "that men suffer from heaviness of the head, and often die from coal gas"—a statement that must date from more than 300 years B. C. He also quotes from Valerius Maximus (2) the following, "Hannibal forced the inhabitants of Nuceria, each with two suits to leave the city, whereupon he prepared baths, and caused the people to be suffocated in them by steam and smoke," showing that this method of putting people to death was known fully 200 years B. C. The use of carbon monoxide gas for poisoning, either self inflicted or with murderous intent, by open charcoal or coal grates, has been frequently employed many times in the centuries which have elapsed, and in the form of illuminating gas is still one of the most common methods for committing suicide both in this and in European countries. The gas is formed wherever combustion of carbon containing material occurs, and as Sayers (3) says, "Carbon monoxide poisoning is one of the most widely distributed and most frequent of industrial accidents. The gas is a product of incomplete combustion and is without color, odor, or taste; therefore, its presence is frequently unsuspected in many places where it exists. It is an ever present danger about blast and coke furnaces and foundries. It may be found in a building having a leaky furnace or chimney, or a gas stove without flue connection, such as a tenement, tailor shop, or boarding house. Hospitals receive a great number of victims of poisoning, whether by accident or in an attempt at suicide, from artificial illuminating gas. Persons may be affected by leaks wherever water gas is formed or used. The exhaust gases of gasoline automobiles contain from four to twelve per cent. of carbon monoxide, and in closed garages men are not infrequently found dead beside a running motor. A similar danger may arise from gasoline engines in launches. The gas is formed also in stokerooms, in gun turrets on battleships, in petroleum refineries, and in the Leblanc soda process in cement and brick plants. In underground work carbon monoxide may appear as the result of shot firing, mine explosions, or mine fires, or in tunnels from automobile exhausts or from coal or oil burning locomotives."

The pathology of the action of the poison was for a time disputed, but it is now generally recognized that the deleterious effects of the gas in the human economy is due to the formation of a comparatively stable compound, by the union of the monoxide with the hemoglobin of the blood, for which it has an affinity three hundred times greater than does oxygen. Because of this, even when only a small amount of the poisonous gas is present in the air and breathed into the lungs, much of the hemoglobin is locked up in combination with carbon monoxide, and so can not keep up its usual work carrying oxygen to the tissues. The result is a withdrawal of nutrition, and if the action is sustained sufficiently long, the damage to the tissue cells becomes permanent, even if the patient survives.

The symptoms of acute poisoning from the gas have long been known and are summarized well by Sayers as follows: "The victim of acute carbon monoxide poisoning usually experiences the following symptoms: Yawning, sleepiness, weariness, and a feeling of constriction across the forehead; frontal headache, at first dull and intermittent, later continuous and more severe; this headache is replaced or masked by the typical headache of carbon monoxide poisoning, at the base and back of the skull, which causes the sufferer to hold his head as far back as possible in an effort to obtain relief; dizziness, nausea, and lassitude also occur. The pulse is at first normal, but later becomes full and rapid, the skin is flushed, the respiration becomes more rapid as exposure to the gas continues, and later becomes irregular. If the exposure is sufficiently long, or the concentration of carbon monoxide is sufficiently great, confusion and unconsciousness develop. As the victim recovers, he remains weak for some time.

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The weakness persists especially in the muscles of his legs. A headache, sometimes severe, confusion, and partial loss of memory accompany recovery, but pass off in time. The nausea may be sufficient to produce vomiting. All the symptoms are accentuated by exercise, eating, and stimulants. When a person is overcome by large concentrations, the symptoms follow each other rapidly and he may fall quickly unconscious. The rate at which a person is overcome and the sequence in which the symptoms appear depend on several factors, viz., the concentration of the gas; the extent of physical exertion; the state of his health and individual predisposition; and the temperature, humidity, and air movement to which he is exposed. Exercise, high temperature, and great humidity, with no air movement, tend to increase respiration and heart rate, and consequently, result in more rapid absorption of carbon monoxide." Fatal accidents from the gas have multiplied in recent years from the enormous increase in the automobile output, and the careless running of engines in closed garages, and are constantly recorded in the daily newspapers. While there are other gases in the exhaust from the automobile, they are of no importance, from the viewpoint of toxicity, and the great danger in such accidents is the sudden loss of power of locomotion, which prevents the escape of the victim from the garage before he is conscious of any dangerous symptoms. The present efficient head of the Department of Public Health, of Philadelphia, Dr. Wilmer Krusen, has issued three important bulletins during the past year on the subject, so that it should be thoroughly known to every one, both physician and layman.

It is, however, to a less well known form of the poisoning that I wish especially to call attention, because it does not seem to have been sufficiently emphasized, and because in conversation with some of our best known clinicians, I have found a lack of knowledge of its occurrence. This is the chronic type of poisoning. It was brought to my attention by a number of cases in my own work as a specialist, a few of which may be briefly summarized as follows:

Case I.—A woman, forty-eight years of age, sought relief from headaches, two years ago. She had been the rounds of physicians, and had been ordered glasses by a competent Philadelphia oculist. She complained of burning of lids, or nervousness, and was ordered a change of glasses. Further study of the case revealed that she had suffered from repeated fainting spells, with loss of consciousness, and alarmingly weak heart action, with weakness of arms and legs; in one of the attacks she nearly died after three fainting attacks, before she was carried out of her apartment on to the porch. Fresh air always revived her, but her health became steadily worse, headaches were nearly constant; appetite vanished, and she suffered from vertigo; anemia became more and more pronounced, until she showed a gray color of both skin and lips. Investigation showed a bad furnace flue and the constant presence in the apartments of coal gas, as shown by the rapid clouding of lime water, when placed in pans on the floor. In summer the symptoms continued because she lived in the first floor of an apartment on West Walnut Street, and the fumes from the constant streams of passing automobiles were drawn into the rooms through the open windows. After removal from this apartment to a quieter locality, where the furnace flue was in better condition, she gradually recovered, had no further fainting spells, and the anemia was slowly disappearing.

Cases II and III.—A man and wife consulted me in June, 1922, referred by Dr. E. W. Kelsey, both complaining of severe headaches. Both had been the rounds for glasses and treatment of nose and throat conditions. The wife wore a belt for relaxed stomach, and the husband was told he needed an operation for appendicitis. Neither could do sustained eye work; both complained of nausea, vertigo and lack of appetite. Both needed glasses, which relieved them somewhat, but questioning showed that their symptoms were always more pronounced in winter, and it was found that they lived over a motorcycle store, and that machines were tested in the cellar of the building, over which there was no suitable ceiling to prevent the fumes of the gas from penetrating the apartments above. It was then recognized that they were suffering from chronic carbon monoxide poisoning. When the windows were open in summer, the air was sufficiently pure to cause no symptoms, but the latter immediately appeared with the cooler weather when the windows were shut.

Two of the best known pediatrists in the city, further, patients of mine, suffered from headaches, one especially from redness of the lids and watering of the eyes, and both from lack of appetite. Eye strain was removed, but symptoms persisted; one of them collapsed, as he entered a hospital door, when making a visit, and in both instances the trouble was found to be due to defective exhausts in the closed cars, which they were driving.

Finally, a prominent physician on North Broad Street, who had had to abandon his sleeping room in the front of the house, because of the disagreeable odors from the exhaust gas on the street, and had even found it necessary to cover his face in a back room, to get relief, arose one morning last summer and had an attack of nausea with dizziness, which compelled him to return to bed. This dizziness forced him to remain in bed for five days, and prevented a return to his office for three weeks. After four months, he writes me, he still feels the depressing effects; he becomes nauseated at once if he passes a car which is emitting heavy fumes, and will have to sell his house and move to another locality.

The effect on the traffic policemen at busy places is also well known. Dr. Hubley Owen, chief police surgeon, writes me that they "have numerous complaints from the traffic policemen, especially in the centre of the city, of headache and nausea at the end of the day's work. This is especially true in the summer, along Delaware Avenue, when the men are detailed regulating automobile traffic across the ferries.

"The foot traffic patrolmen complain of gastric disorders more frequently than the men from the districts. In many cases, these symptoms have actually been so persistent that I have sent them to the hospital for gastrointestinal x ray study and gastric analysis. I find that these studies are negative, and that after the men have had a few days' rest from

their traffic duties, their symptoms have been relieved."

It is equally well known that in many large garages, especially where repair work is done, on the upper floors, that many of the employees go home daily with severe headaches, and are oftentimes nauseated after a day's work.

The most common symptoms, aside from the headache and nausea, are dizziness, palpitation of the heart, general fatigue, lack of mental concentration; sometimes neuralgic pains; temporary amblyopia, which occasionally becomes permanent as a result of retrobulbar neuritis, ocular palsies, congestion of the the mucous membranes of the nose and throat and eyes, with dryness of the throat, irritation and watering of the eyes. Finally changes in the mental state may occur; loss of will power, lack of decision, restlessness and irritability on the slightest discomfort, insomnia and at times visual hallucinations. Dr. W. H. Wilmer (4) of Washington read an illuminating paper on the subject before the Section on Ophthalmology of the College of Physicians in this city in October, 1920, detailing the history of a family, all of whom, including servants, were affected by gas from a defective heater, and had hallucinations of vision and hearing. One child had visual defects, due apparently to optic neuritis. Ultimately the prolonged effect of the poison results in marked anemia, the patients presenting a gray, or yellowish color, and the blood count sometimes showing a reduction in the red cells to as low as 1,500,000 to the c. m., although no destruction of the corpuscles has been reported. General muscular asthenia at times results, and edema of the tissues, especially of the lower extremities, with disturbances of sensation and atrophic skin and muscle changes.

The condition of the air in the large cities, especially in the canyonlike thoroughfares of the central districts, is one which may well give thought to physician and sanitarian, and question as to the future. At times to a normal individual the gasladen atmosphere during heavy afternoon traffic is very trying, and to those previously affected by an acute poisoning by carbon monoxide, difficult to breathe. Many examinations of the air in New York Gity have been made, especially under the direction of Professor Yandell Henderson of Yale University, to whom we owe many valuable papers. His work was done in connection with calculations of the amount of carbon monoxide which can be safely breathed, in drawing up plans for the construction of the vehicular tunnel connecting New York city with New Jersey. He has shown that the exhaust gases of gasoline automobiles contain from four to twelve per cent of carbon monoxide, and experiments with an automobile in a closed building having shown that the engine discharges approximately one and five tenths cubic feet of carbon monoxide a minute. He likewise has shown when the time of exposure in hours multiplied by the concentration of carbon monoxide in parts per ten thousand of air equals nine, headache and nausea are induced, and when it equals fifteen or more, the conditions are dangerous to life. Moreover, if the volume of breathing is increased by exercise, (even by slow walking) the rate of absorption of carbon monoxide is increased proportionately.

In New York city, observations show that during moderate traffic, and on clear windy days, the conditions in the streets are on the average such as to imply no appreciable health hazard. When the traffic is congested, however, the air especially back of the large omnibuses is badly contaminated, and a source of danger. The problem, is, therefore, already an important one, and is likely to become more vexing as time goes on.

Prof. Henderson and Dr. W. H. Haggard (5) have made one excellent practical suggestion, that the exhausts of all closed cars, which constitute a large proportion of the vehicles now used, should be carried vertically up the back of the car, so that the gases may be discharged upward, and thus out of the respiratory zone of street air. As they justly remark, "the exhaust gases from automobile engines, are far more toxic than the smoke from the chimneys of dwelling houses, or from the smoke stack of most factories, or the funnels of locomotives. In amount the total volume of exhaust gas discharged in some single streets is not less than that from a large factory or power plant. For the smoke from dwelling houses and factory furnace chimneys are provided, and indeed required by law, to discharge as high into the upper air as possible. Experiments have shown that no appreciable loss of power results when the automobile exhaust is so arranged, and that there is nothing impracticable in so equipping trucks, omnibuses and closed passenger cars. The exhaust gas has about the same specific gravity as air of the same temperature, but being extremely hot, it is much lighter than street air, and if started upward above the level of pedestrians' heads, it would rise and escape out of the street and over the roofs, like a puff of smoke. Moreover, as most of the air which enters buildings passes through the doors, windows and gratings of the lower floor, while through the upper windows the draft is usually outward, except when there is a strong wind outdoors, the air entering the buildings would be less contaminated, where the gases started upward at a higher level. Further experiments in public garages made by Henderson, have shown that the problem of ventilation is a much simpler problem with the vertical exhaust, and the fire hazard is also reduced, as gasoline spilled on the floor can not be ignited by the vertical exhaust. With the horizontal exhaust the entire air of the garage is rapidly mixed with the gas, and adequate ventilation of garages is at present virtually not feasible." This seems to be the only practical method of offering much relief from air contamination. Full study of other remedies, such as hose connections to the exhausts of cars in garages, gas mask canisters on the exhausts and similar suggestions, have for one reason or another proved not practicable.

They suggest that legally the remedy could be applied by the state licensing authorities charging an additional ten dollars to twenty-five dollars a year on all cars using a horizontal exhaust. If such a bill were passed by the state legislatures, the car manufacturers would soon be compelled to make the necessary changes.

For garages the authorities should insist on proper ventilation, and so far as possible insist that repair shops should not be on the second floor, unless the ceilings are impermeable, and no openings should be allowed from the lower floors. The present require-

ments as to garages under private dwellings or apartments in the city of Philadelphia, which have been furnished me by Mr. Edwin Clark, chief of the Bureau of Building Inspection, are as follows: Garages may only be erected in the basement of one or two family dwellings. In the case of two family dwellings, it is permissible to have a basement partitioned off, so as to provide separate garage space for two cars. Basement garages are not permitted in apartment or tenement houses housing more than two families. When a basement is used for this purpose however, the walls and ceilings must be constructed of fire proof material, and the only openings into such basement garages must be from the outside of the building. No opening is permitted from the garage itself leading to the house above, nor to the cellar. Such requirements seem to be entirely satisfactory, and obtain also in Montgomery County, although architects do not always so arrange the construction. The general lack of information on the subject is responsible for the fact that the law is sometimes violated, because of the inconvenience of going outside the house to enter the garage, and health considerations are neglected.

The subject of poisoning from coal gas in houses and apartments from defective flues is also of great importance, and the great danger of cleaning out flues without letting furnace fires go out should be recognized. A case of acute poisoning recently studied by Dr. Fred Hartmann, Dr. Theodore Weisenburg and myself, which may result in permanent motor and sensory disturbances, is fresh in my mind, but in the present discussion, this topic is not germane.

Finally, before closing I desire to call attention to the added danger from the unnecessary running of automobile engines while standing on the city highways. Few large trucks are provided with self starters, and in cold weather, with the stiffening of the lubricating oils, cranking is physically difficult, so the drivers of such trucks frequently allow their engines to idle while loading, or unloading. The same is true of practically all the taxicabs in the city. The two chief companies here run approximately twenty-five hundred cars, none of which are provided with generators or selfstarters. At many cab stands from three to five cars will be found idling, despite the rules of the companies, because it is too much trouble for the men to crank their engines. In ordinary open city streets, when traffic is not heavy, this is not of so much danger. Where, however, as at the principal railroad stations, the space is confined, the accumulation of gas is very pronounced. At Broad Street station of the Pennsylvania Railroad from eight to ten cars run constantly, the air is foul, and is drawn into the station itself, and upward into the waiting room. At the West Philadelphia station usually twelve to fifteen cars are found running on an average. Inquiry of the starter from the cab company at this location revealed the fact that he goes home almost daily with headaches and nausea and lack of appetite, which his doctor can not relieve. In winter the effect on the ticket sellers inside is not pronounced, but I am told that in warm weather, when the doors are opened, many of them suffer perfectly typical symptoms of chronic carbon monoxide poisoning. This is a matter which could be readily controlled, it seems to me, by an ordinance in councils prohibiting unnecessary idling, or limiting the number of cars which can be thus running at any one cab station, and fining the companies where this number is exceeded.

This paper is rather desultory and presents no new facts, perhaps, but if it serves to impress upon the general practitioner the importance of going into the living conditions of his patients, and making inquiries as to the possibility of chronic poisoning by carbon monoxide in those suffering from headache, gastrointestinal disturbances, anemia, lowered nutrition and neurasthenia, my purpose will have been served.

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2046 Chestnut Street.

Hay Fever Pollens in the Upper Air

Records Established by Airplane Flights

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OBJECTS OF POLLEN DENSITY TESTS

The general area that may be affected by hay fever plants and trees is an important factor in the etiology and prevention of hay fever and seasonal asthma. In immunological methods against these diseases, it is important to determine the pollens that are responsible for the attacks in the patient under treatment, and this requires not only a botanical survey of the surrounding territory, but also a knowledge of the distances that pollens may be carried under favorable conditions (1). If measures for control of hay fever plants are undertaken, the potential area of their pollen must also be known in order to determine the distance to which the weeds must be controlled. In both of these cases, the altitude that the pollens may attain is an important factor.

With a view of ascertaining these altitudes, an initial series of airplane tests was arranged by the American Hay Fever Prevention Association in the fall of 1923. These test flights were conducted under the direction of Mr. B. R. Coad, of the United States Department of Agriculture, at Tallulah, La., the exposed plates being sent to our New Orleans laboratory for inspection and recording.

These tests were carefully planned, preliminary flights being first made in order to ascertain the best material to be used on the exposed plates, and the length of time that these should be exposed at the various elevations. An exposure of twenty minutes was found to be the most effective, as a shorter time

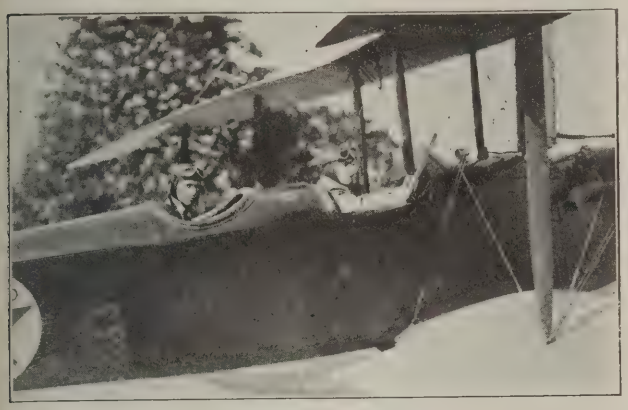

FIG. 1.—Standard airplane from which tests of hay fever pollen density in the upper air at New Orleans were made.

failed to furnish sufficient pollen to establish definite results, and a longer exposure resulted in the drying of the film by the rapidly passing air currents, and the consequent loss of the deposited pollens.

RAGWEED POLLEN CLOUDS

This series of tests established the fact that airplanes furnish a practical method of testing hay fever pollen density in the upper air. The records of these proved that the ragweed pollens, which are the most common in the air in the fall, when the first tests were made, are found in large numbers in the air up to the altitude of four thousand feet, and in diminished numbers as high as six thousand feet. Above this altitude up to fifteen thousand feet, which was the limit of the first series of flights, the pollens were also present but comparatively few in number (2).

Unless precipitated by rain, the clouds of ragweed pollens remain in the air practically during the whole pollinating season of these weeds, the fallen pollen being replaced by new pollen brought up by ascending air currents. The existence of these pollen clouds, and their gradual descent due to the cessation of ascending currents, explain the increase of hay fever pollen after sunset and during the prevalence of cold winds, both of which are associated with aggravation of hay fever attacks.

SPRING HAY FEVER POLLENS

As the initial series of airplane flights was made in the fall, it was decided to make an additional series of tests, the planes being again under the direction of Mr. B. R. Coad of the United States Department of Agriculture. The lowest altitude that was tested is the "hedge hopper," in which the airplane flies at as low a level as permitted by the trees and hedges. The greatest altitude attained in this series was seventeen thousand and nineteen thousand feet, respectively. All tests over ten thousand feet are made under considerable personal discomfort, as the cold is intense in spite of the special clothes and gloves worn by the observer and the pilot.

As in the previous series of flights, each exposure was made for twenty minutes, the plates being placed in a special holder, and afterwards sealed and sent to our New Orleans laboratory for examination. The speed of the airplanes averaged about eighty miles an hour. As the result of our experience in the first series of tests, the first exposure was made at each lower level of two thousand feet. At the same time, another airplane made tests at the intervening two thousand feet, so that records were made at each thousand feet levels in these tests.

The record of the airplane tests of the pollen density of the series of flights from May, 1924, to September, 1924, follows:

RECORDS OF AIRPLANE POLLEN TESTS

May 19, 1924

Altitude	*Grass*	*Ragweed*	*Tree*	*Pine*	*Other*	*Total*
H-H	132	0	684	3	22	841
200	126	0	1021	12	75	1234
1000	152	0	1035	0	57	1244
2000	159	0	558	0	36	753
3000	237	0	1312	0	42	1591
4000	57	0	105	0	7	169
5000	12	0	12	0	17	41
6000	3	0	5	0	9	17

August 16, 17, 1924

Altitude	*Grass*	*Ragweed*	*Tree*	*Pine*	*Other*	*Total*
100	182	48	37	2	144	413
1000	33	17	22	0	108	180
2000	45	9	45	0	114	213
3000	84	11	16	0	132	243
4000	24	7	9	0	52	92
5000	18	6	3	0	57	84
6000	15	0	6	0	65	86
8000	24	0	11	3	72	110
10000	6	0	3	0	42	51
12000	0	0	1	0	21	22

September 8, 9, 1924

Altitude	*Grass*	*Ragweed*	*Tree*	*Pine*	*Other*	*Total*
1000	28	1583	3	0	148	1762
2000	16	217	5	0	93	359
3000	7	117	9	0	54	187
4000	12	16	6	0	47	81
5000	17	19	1	3	29	69
6000	24	43	0	0	53	120
8000	27	7	2	1	19	56
10000	31	3	0	0	13	47
12000	15	0	0	0	5	20
14000	5	0	0	0	11	16
17000	7	0	0	0	7	14

September 15, 1924

Altitude	*Grass*	*Ragweed*	*Tree*	*Pine*	*Other*	*Total*
H-H	48	661	3	0	241	953
1000	39	489	1	0	127	656
5000	91	753	5	0	309	1158
19000	0	0	0	0	23	23

September 29, 30, 1924

Altitude	*Grass*	*Ragweed*	*Tree*	*Pine*	*Other*	*Total*
H-H	84	1782	0	0	138	2004
1000	36	6056	0	0	127	6219
2000	29	2166	0	0	83	2278
3000	20	1558	0	0	36	1614
4000	5	114	1	0	22	142
5000	6	84	0	0	29	119
6000	7	62	3	0	37	109
7000	16	78	0	0	44	138
8000	8	75	0	0	23	106
9000	4	72	1	0	42	119
10000	5	66	0	0	38	109
11000	8	18	0	0	24	50
12000	6	12	0	1	12	31

VARIATIONS OF HAY FEVER POLLEN DENSITY

The presence of these large numbers of pollens in the upper air show that, on account of their buoyancy, they are conveyed upward by the ascending air currents until the convective currents cease to be active. Unless precipitated by rain, the pollen clouds may remain for a time in a state of equilibrium. The distance to which they will then be carried horizontally in their descent will depend upon the velocity of the wind, and may be calculated by multiplying

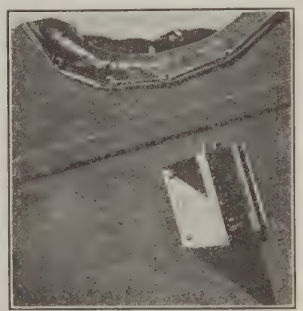

FIG. 2.—Special holder used on the DeHaviland 4 B airplanes for testing pollen density at Tallulah, Louisiana.

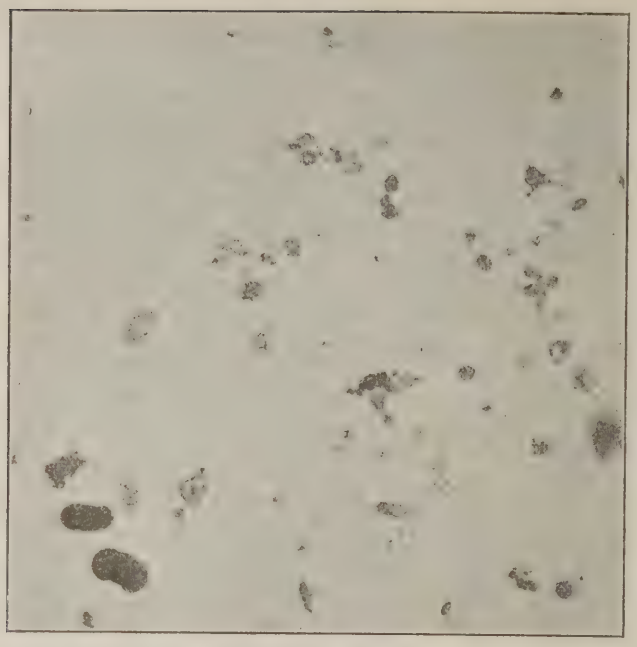

Fig. 4.—Photomicrograph of pollen plate exposed at two thousand feet elevation in New Orleans, March 10, 1925, showing pine grass, and dock pollens. x 200 diameter.

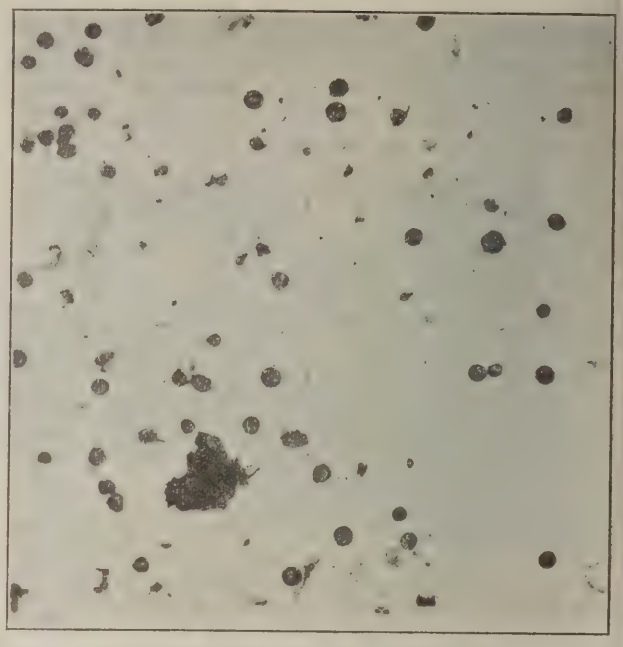

Fig. 5.—Photomicrograph of pollen plate exposed at three thousand feet elevation at Tallulah, Louisiana, May 19, 1924, showing tree, grass, and other pollens. x200 diameter.

the velocity of the wind by the time of the fall (3).

These records illustrate the various changes in pollen density in the upper air, as influenced by seasons and meteorological conditions. In the test of May 19th, while the grass pollens were fairly common, the tree pollens formed the most important factor in the pollen density. No ragweed pollens were found in this test, as these do not begin to be produced until August, as evidenced in the record of August 16th and 17th, in which the ragweed pollens were found in small numbers to about three thousand feet, the grass pollen in diminished numbers, and a low record all pollens generally. By September 8th, however, the ragweed pollens became much more numerous, but there was a sharp fall in the density at two thousand and three thousand feet, differing in this respect from the records of the tests made September 15th and September 29th and 30th.

Fig. 3.—Photomicrograph of pollen plate exposed at two thousand feet elevation, at Tallulah, Louisiana, showing tree and grass pollens. x 200 diameter. (*Reduced one quarter.*)

On September 30th, which is the height of the hay fever season in the Southern States, the record of the ragweed pollen density was very high, there being almost twelve thousand pollens on the four plates exposed up to an altitude of three thousand feet. At four thousand feet, however, there was a sharp fall in the density.

The records of the exposed pollen plates vary at different altitudes and locations, showing that the pollen clouds change their position and density in accordance with the variations of the air currents of the traversed territory. These vary constantly, as shown by the behavior of airplanes over terrain of various characters. Vertical air currents of various velocities are constantly encountered, so that it is necessary to compensate almost continuously for them in operating the control of the plane. This is more noticeable at the lower elevations. In flying over New Orleans, for instance, at an elevation of one thousand feet, there is considerable roughness in the airplane, while at three thousand and four thousand feet, the sailing may be quite smooth. These conditions tend to change, moreover, as the day progresses, and as different objects absorb or radiate additional heat.

AIRPLANE POLLEN TESTS AT NEW ORLEANS

As all the series of tests were made in the northern part of Louisiana, it was decided to make a check test at New Orleans in order to ascertain the influence of conditions due to a large city in which most of the area is covered by streets and residences, and with a relatively smaller number of plants and trees distributing the pollen. New Orleans has the Gulf of Mexico to the Southeast and Lake Pontchatrain to the North, and the influence of these bodies of water also required investigation. With a view of testing these conditions, the author made an air-

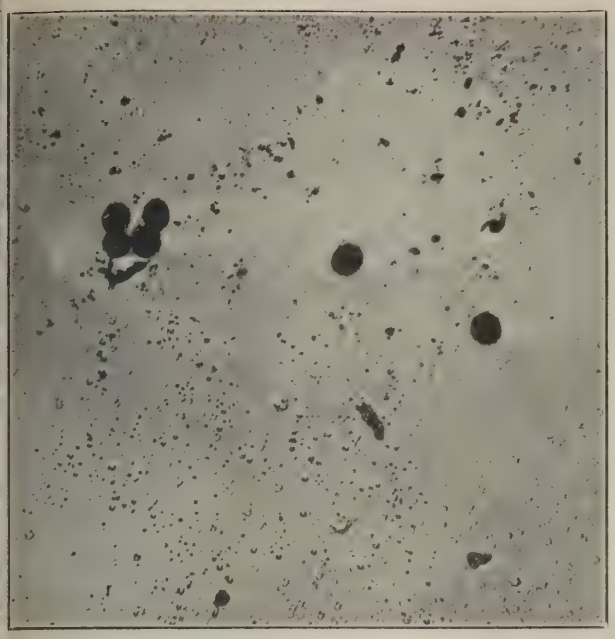

FIG. 6.—Photomicrograph of pollen plate exposed at five thousand feet elevation at Tallulah, Louisiana, September 15th, showing ragweed pollens. x200 diameter.

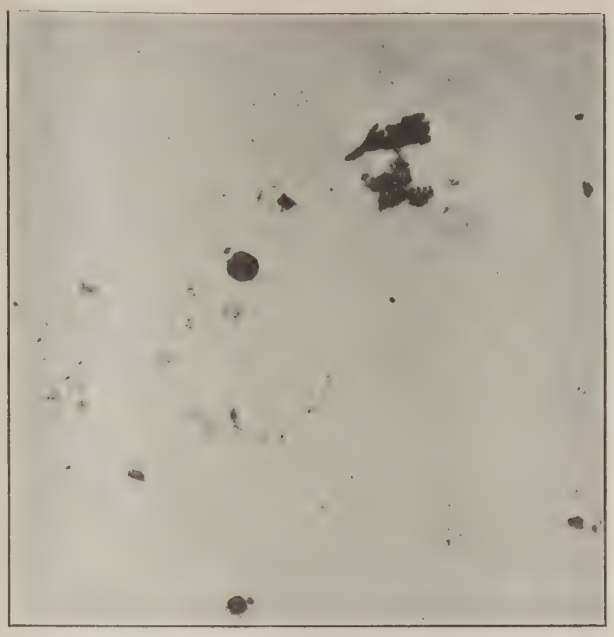

FIG. 7.—Photomicrograph of pollen plate exposed at ten thousand feet at Tallulah, Louisiana, showing ragweed pollens, September 29th. x 200 diameter.

plane test at New Orleans on March 10, 1925. The record of this follows:

Altitude	*Grasses*	*Rumex*	*Cedars*	*Pine*	*Other Pollens Prin. of trees*	*Total*
1000 ft.	976	59	114	72	2416	3637
2000	328	22	65	17	636	1068
3000	169	9	17	3	163	361

This test was made five weeks earlier in the season than the one of May, 1924, at Tallulah, but also demonstrates the larger number of tree pollens which are found in the upper air in the spring season. The noteworthy feature, however, is that while the tree and grass pollens were found at Tallulah with little diminution up to three thousand feet, there was a sharp fall in New Orleans after the first thousand feet, and comparatively few at three thousand feet.

The difference in these records is evidently due to the large area covered by residences and streets in New Orleans, and the large area of surrounding water. As comparatively few pollens arise from this area, the pollens found are evidently descending from pollen clouds formed in the surrounding territory, which explains their lower level.

CONCLUSIONS

These series of airplane tests demonstrate that hay fever pollens are commonly found in large numbers up to high altitudes during the pollinating season of the plants and trees which produce them. The distance that they traverse in their descent may therefore be five to ten miles, according to the variety of pollen in the air, and in the botanical survey to ascertain the incriminating pollens of any special locality, this must therefore be taken into consideration.

The presence of the pollen clouds, and their change of position, not only by winds but also by ascending and descending air currents, explain many of the phenomena associated with hay fever, such as the aggravation of the attacks after sunset and during cold changes in the midst of the hay fever season.

The extensive potential area of hay fever pollens, as demonstrated by the airplane tests of the density in the upper air, also shows that the effective control of hay fever by the enactment of municipal antiweed ordinances is insufficient. While such laws are of undoubted assistance, complete relief can be obtained only by legislative cooperation of the various States and of the Federal Government. The facts as demonstrated in this report indicate the need of such legislation.

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AUDUBON BUILDING.

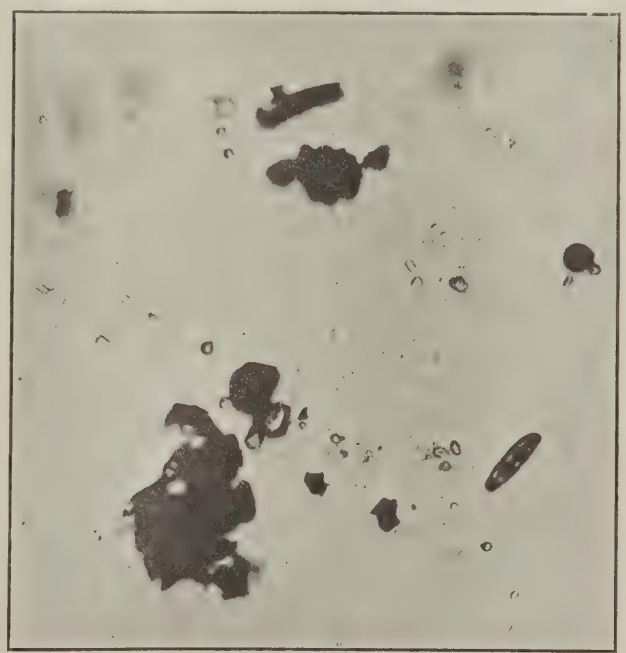

FIG. 8.—Photomicrograph of pollen plate exposed at fourteen thousand feet elevation, at Tallulah, Louisiana, September 30th, showing ragweed pollens and rust spore. x 400 diameter.

Studies in Pollen Sensitiveness

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The deductions in this article are based, first, on almost daily examinations of the pollen content of the air over a period of almost two years. Specimens were taken in both the residence and business districts of San Antonio, and also for comparison, from several of our neighboring cities and towns. A previous article may be referred to for a discussion of the botanical aspects of this study (1).

Secondly, the conclusions clinically are based on an intensive study for three years of over two hundred and fifty cases of pollen hay fever and asthma, principally of perennial chronic asthma, the form of pollen allergy most commonly met with in this section. The history of the duration of the patient's symptoms, coincident with the appearance and duration in the air of hay fever or asthma reacting pollen, along with the exhibition of cutaneous irritability in the form of the usual reactions as provoked by the intradermal tests to such pollen, were assumed to make the diagnostic connection complete, especially when it was possible to secure the prevention or abatement of the usual symptoms by the use of the pollen precautions to be mentioned or treatment with extracts of the pollen or pollens in the air and giving indubitably positive skin tests.

In San Antonio and vicinity we have four active important antigenic pollen factors, each with a definite pollination season: winter, the grasses (Gramineæ and mountain cedar (Juniperus sabinoides); spring, the grasses (Gramineæ); summer the grasses (Gramineæ), carelessweed (Amaranthus blitoides) and fall the grasses (Gramineæ), carelessweed (Amaranthus blitoides) and ragweed (Ambrosia trifida). In early spring, our pollen plates are also loaded with tree pollen, chiefly live oak and hackberry, but only the grasses seem of clinical importance. The chenopods (Chenopodiaceæ), sages (Artemisias) and Russian thistle (Salsola pestifer) are not factors in this vicinity.

Patients may be sensitive to any combination of these causal factors, so that with us simple pollen hay fever is frequently perennial, or almost so. In addition, it will be noted that the duration of our principal factor, the grasses, is practically perennial. Pollen disappears completely from the air only for a few weeks following a killing frost which does not occur until the second week in January, and reappears in the air in March, in small quantities it is true, but enough to annoy hypersensitive subjects. Ordinarily most of our grass seasons cases start in April. There is a slight subsidence of grass pollination in August, but a recrudescence in early September, coincident with the onset of the ragweed season. In fact, our grass pollination reaches its highest peak in September and October, and in this vicinity, pure grass autumnal hay fever and asthma are not uncommon, without additional ragweed sensitiveness.

The variety of pollen factors existing locally, the relatively large amount of pollen granules almost constantly in the air, the prolonged duration of the pollination season of our principal factor, the grasses, the selection of this point by chronic perennial asthmatics as a climatic resort, giving abundant clinical material, makes San Antonio an ideal spot for the study of the various phases of pollen sensitization in diagnosis and treatment. It is not only necessary for us to attain an immunizing dose sufficient to give clinical protection, but owing to the absence of the seasonal factor in almost all our cases, such protection must be maintained, a factor which does not enter into the consideration of these cases in the north and east.

With diagnostic presumption eliminated as a result of carefully made air pollens analyses eighteen months previously, checked up by actual field surveys, our efforts during the past year have been to secure a pollen extract dose in each instance that would afford absolute clinical protection. In many of our failures of past years the patients have been called back for purposes of study, and carried under experimental observation for many months. All cases were private, the patients being of rather more than ordinary intelligence. The pollen extracts used in this work were furnished by Dr. W. W. Duke of Kansas City (sixty-six and two thirds per cent. glycerine, thirty-three and one third per cent. Coca's solution). The total number of pollen allergic cases seen this year, 115, furnish the basis for this study.

Treatment, where possible, was preseasonal, of course, by at least three or four months. Owing to the fact that it was early realized that undoubtedly sensitiveness would differ in degree in these hypersensitive individuals, at the onset, an attempt was made to determine such variabilities in each instance by noting the dilution of the offending pollen extract failing to elicit a cutaneous reaction, and using such dilution as a basis for the inception of immunization treatment.

TECHNIC

The following preliminary routine testing dilutions were employed in each instance: 1:5,000, 1:500, 1:50, and 1:20 where previous weaker dilutions were negative. In most instances it was possible to secure a complete negative or only a very slightly positive skin reaction with the 1:5,000 dilution, permitting the inception of treatment with this dilution. Where the dilutions mentioned above all gave good undoubtedly positive reactions, tests were then repeated with dilutions of 1:20,000, 1:40,000, and on one or two occasions we were compelled to begin treatment with a 1:80,000 dilution, as in our experience no treatment is safe to start with that gives a positive skin reaction. However, on the other hand, this method of differentiating degrees of sensitiveness, often permits of the saving of a considerable amount of time by allowing treatment to be started with a 1:500 instead of the usually commercially recommended initial dose of 1:10,000. Doses

proceeded in the following sequence, a sequence which we have seen no reason to change: 0:05 c.c., 0:1 c.c., 0:2 c.c., 0:3 c.c., 0:4 c.c., except in changing from a 1:50 to a 1:20 extract, where the skip was made from 0.2 c.c. of 1:50 to 0.05 c.c. of the 1:20 extract. Succeeding doses of this strong extract were given as follows: 0.05 c.c., 0.1 c.c., 0.15 c.c., 0.2 c.c., 0.25 c.c., 0.3 c.c., 0.35 c.c., 0.4 c.c., 0.45 c.c., 0.5 c.c. Doses were given not twice a week but twice a day, and on several occasions three times a day, in the weaker dilutions, allowing an interval of at least three hours between doses. Cases were held under observation for at least a half hour following treatment, and the arms in each instance examined before any treatment injection was given, to determine the slightest evidence of cutaneous reactions resulting from the previous dose. When the 1:50 extract was reached, doses were then given daily instead of twice a day, and every other day with the 1:20 extract. The slightest erythema or induration at the site of the needle puncture called for a repetition of the dose as many times as necessary until its tolerance was denoted by the absence of the slightest evidences of cutaneous irritability (wheals, erythema, induration), and no treatment of any kind was given until all evidences of reaction induced by previous treatment had completely disappeared, no matter how many days were required.

COMMENT

The foregoing gives a rational method for the induction of tolerance, and in practice, works out well. What is being sought, is a definite tolerance sufficient to take care of an indefinite varying amount of air borne pollen, and to take care of any amount of such pollen for as long a period as it exists in the air. It has been our experience that the skin reaction, in all but a few instances, gives a reliable guide to dose and interval. If the skin is intolerant to a certain dose, there is no reason why the nasal or bronchial mucosa should tolerate it any better, and it has been our experience that if too large a dose is started off with, or if the increase in dose is persisted in, in a mechanical manner, disregarding the warnings given by the skin, hay fever, asthma, and at times intense urticaria and erythema multiforme will result, all symptoms of pollen anaphylaxis, which are free from serious danger. At times, in spite of all precautions, such reactions will be produced by the accidental deposit of treatment in a small vein. Epinephrin should be given at once in doses of from 0.5 c.c. to 1 c.c., and repeated every ten to twenty minutes until relief is secured. In fact, no one should do this work without having epinephrin at hand to meet this eventuality which may arise even from testing.

These severe reactions, and in fact even mild general constitutional reactions, aside from the risk and discomfort to the patient, are regrettable from another point of view, in that they increase hypersensitiveness. For instance, it is assumed that a patient has taken 0.1 c.c. of a 1:50 dilution without reaction. An intradermal test of this patient at this time will show a negative test to a previously 1:5,000 positive, and in most instances a negative or only a bare suspicious test to a 1:500 dilution, and only a bare + or ++ to a 1:50. Assume that with the 0.2 c.c. dose, a heavy reaction ensues. If this patient be retested for graduated sensitiveness next day, not only will the 1:50 extract dilution be found to give a ++++, but also the 1:500, and very often the 1:5,000, thus defeating the very end desired. We have found the continuance of the use of epinephrin two or three times a day for several days after the quiescence of the reaction a great help in reducing this hypersensitiveness, and treatment can then usually be safely resumed with a dose of about twenty-five per cent. of the one causing the general reaction. However, it had better be held at this point for one or two repetitions before increasing. We have found that in cases giving persistent local reaction with the daily use of any extract, it is frequently possible to secure the elimination of these reactions by increasing the dose interval to two or three days.

There is scarcely anything more discouraging, or more alarming, to the patient than a severe general reaction. What is being sought in these cases is the gradual induction of tolerance. Overdosing does not bring about but only delays this process. Pollen immunity is a tolerance rather than a real immunity, as bacterial immunity is apparently not prevented by the induction of rather severe general reactions, and is relatively permanent, as witnessed by typhoid prophylactic injections. The duration of pollen tolerance, on the whole, when once induced, usually is too fleeting to be a real immunity.

DOSES OF EXTRACTS REQUIRED FOR PROTECTION

The final dose of a pollen extract necessary for protection must vary according to the section of the country and the individual pollen, and can be learned only by hard actual experience. The dose of a grass extract in the north, with a three or four weeks' pollination season, must be vastly different from what is required in Houston or San Antonio, Texas, with a ten to twelve months' season and a vastly greater amount of pollen in the air. We cannot state anything positive about these necessary doses except for San Antonio cases. In our experience, this is as follows:

Spring grasses, 0.2 c.c. of a 1:20 dilution.
Fall grasses, 0.35 c.c. to 0.5 c.c. of 1:20.
Carelessweed, 0.1 c.c. of 1:20.
Ragweed, 0.2 c.c. of 1:20.
Mountain cedar, not fully worked out.

These are average figures. Several of our patients have attained perfect clinical protection on far smaller doses. In only a few of our grass cases has the final dose of 0.5 c.c. of the 1:20 extract had to be given. Ordinarily 0.4 c.c. was found sufficient. In not one of our cases have these doses once reached with the cessation of reactions, failed to give the desired clinical result. Unless such final dosages are reached without reactions, the patients are not immunized, and almost invariably continue to have symptoms.

It is regrettable that no method of standardization has as yet been discovered that will permit the comparison of the extracts secured from Dr. Duke with ordinary commercial extracts, but Dr. J. H. Black, of Dallas, Texas, has shown that our usual nitrogen determinations are of no value in this connection, (2), and no other method has been published.

Our efforts were to secure, not merely a dose that would afford a certain amount of protection, but a decided protection as shown by the elimination of the previously positive skin diagnostic test. As long as these initial skin diagnostic tests (ordinarily made with 1:50 extracts) remain positive at the end of treatment, any immunity secured by treatment is only partial at the best, and results will be uncertain. Relief can be counted on only in the presence of a short pollination season and interruptions of the seasonal pollen content of the air by intercurrent rainfall, or conscious or unconscious pollen precautions. Partial immunity secured by the advertised doses of the ordinary commercial extracts, in this end of the world of limited rainfall and prolonged pollination seasons, was not successful in over ten per cent. of our cases handled in previous years. As a matter of fact, in a number of our cases the hay fever or asthma has persisted unchanged following the complete elimination of these 1:50 commercial extract positive skin tests. These cases still showed positives to the Duke 1:50 extract, indicating its greater strength. Elimination of the positive skin test with the 1:50 Duke extract is a far more reliable guide to protection, but even this is not infallible.

NUMBER OF DOSES REQUIRED TO SECURE IMMUNIZATION

We do not consider this of any importance. It is absolutely impossible to make the slightest pretreatment estimate on this point. The number of doses will vary from forty to sixty, or even over a hundred in a stubborn case. We have had to repeat a single dose on occasions from five to nine or ten times to get by. In making this statement, consideration must be taken of the fact that most of our work is with seasonal cases having symptoms, and far more difficult to handle than the ordinary symptom free preseasonal case.

COMPARISON BETWEEN DAILY AND BIWEEKLY INJECTIONS

It is our opinion that the twice a day or daily method of giving treatment which we have used for the first time this year is far more satisfactory to all concerned. Out of town patients will readily consent to a few weeks of intensive treatment. Reactions to us seem fewer by this method, and tolerance far more rapidly secured, and relief to seasonal cases is infinitely more prompt.

DURATION OF POLLEN IMMUNITY OR TOLERANCE

Only a few patients, immunized in previous years and failing to report for treatment again this year, have remained well. While pollen immunity thus may be permanent, in most instances it is only transient, lasting at the best only a few weeks, and at times only a few days. We have had occasion to observe a number of patients whose treatment was carried to the point of elimination of the original 1:50 diagnostic test, who for one reason or another suspended treatment for three or four weeks. Retesting these cases has then shown + + + + positives to a 1:5,000 dilution and recurrence of symptoms and the work has had to be done all over again. It is our opinion, judging from analogy with our grass cases, that if the ragweed season in the north lasted three or four months, instead of six to eight weeks, most of the preseasonally immunized cases would relapse at the end of two months. But even here in San Antonio, this is not invariably the fact. One of our carelessweed cases, an extremely hypersensitive individual who gave a severe general constitutional reaction with his original diagnostic skin tests, and who was immunized in the spring of 1924 with great difficulty, had to give up treatment in the early summer. On retesting him in early July, his skin again gave a + + + + positive reaction to a 1:10,000 dilution, with constitutional symptoms from the tests. He was unable to resume treatment. Much to our surprise, he passed through the carelessweed season (July, August, September, October and early November) without the slightest signs of hay fever and without any change in previous environment or mode of living. Why, we cannot understand. Such cases in our experience are an extreme rarity, and for this reason, it is our custom not to permit the pollen immunity to lapse, once it has been induced. This is especially necessary in the grass cases, who make up the bulk of our work, on account of the ten to twelve months' pollination season. Polen immunity once induced can be maintained indefinitely by the use of the maximum dose first at biweekly and later at weekly intervals. The appearance of a cutaneous reaction during such immunity maintenance indicates a beginning loss of immunity and the necessity for the resumption of more frequent doses. We frequently accustom our patients to give this weekly maintenance dose to themselves.

DIAGNOSTIC TESTING METHODS

Our tests were all by the intradermal method, using approximately 0.01 c.c. of material. Many of our pollen cases were found in addition with positive skin tests to various animal hair emanations, foodstuffs, feathers, orris, etc. These factors were, of course, taken care of in the usual manner. When our patients showed the usual positive pollen skin tests, and in corroboration could be shown to be worse out doors, clearing up in closed rooms and relapsing with outdoor existence, they were considered pollen cases.

NASOPHARYNGEAL OPERATIVE PROCEDURES

In none of our cases of either hay fever or asthma were the patients given any local nose or throat treatment, though most of our chronic asthmatics had had various intranasal surgical operations done previously without benefit to such condition. In fact we never have the noses, mouths or throats of our allergic patients even examined, except occasionally for diagnostic purposes in the presence of definite urgent local symptoms indicative of pathology of no connection with the allergic symptoms. Our patients have secured full asthma or hay fever relief in the presence of chronic sinusitis, abundant polyp formation, dental, tonsillar or abdominal disease. We even had one patient lose his asthma under pollen precautions in the presence of a fatal carcinoma of the liver. We have found the usual aromatic oil sprays commonly used by otolaryngologists *definitely* harmful in these conditions, and limit our local treatment to a simple albolene spray in hay fever.

VACCINE THERAPY

No vaccines, stock or autogenous, were used at any me in the treatment of this series of cases. We ave not seen a single case of hay fever or asthma iat we could consider of bacterial etiology. We do ot include the bacterial proteins in our tests.

OCAL EXHAUSTION OF THE TISSUES TO FREQUENT INJECTIONS

In our experience, this is extremely doubtful. We ave on hand a motorman practically free from ymptoms for months, who is constantly in contact vith his pollen influence (grass) and whose precaucions can be only minimal, and consequently is an xtremely difficult case to immunize. He has reeived 0.1 c.c. of a 1:20 dilution in the same arm leven times, each time giving the same + or ++ ocal reaction until the twelfth injection, the local eaction reappearing unmodified on the thirteenth, ourteenth, fifteenth and sixteenth injections of the ome dose in the same area.

NDIVIDUAL SPECIFICITY OF CORRELATED BOTANICAL GROUPS

The question has been raised as to whether immunization with the short form of ragweed protects gainst the tall form, and vice versa. We used an xtract of the tall form exclusively for treatment this ear. While our treated cases were few in number three pure ragweed only, nineteen combined with rass), our clinical results have been practically perect in every instance. We have in San Antonio litle or no short ragweed. It is replaced by an abunlant growth of Gartneria tenuifolia of the same Compositæ family, against which giant ragweed reatment apparently gives perfect protection. Its ollination season lasts longer than the giant ragweed by two or three weeks.

The question has also arisen as to whether immunization against one grass protects against all. In this connection, we had a curious and interesting xperience. We started to immunize twenty grass ases in January, 1924, using commercial extracts of Bermuda and Johnson grass, our commonest grasses. By March the supply was exhausted, and no more ould be secured. In our dilemma, Sudan grass was suggested by Dr. Duke, and practically all of our subsequent work this year was done with extracts of this grass which grows here only in great scarcity, ut botanically is closely related to Johnson grass. When the supply of this material at times ran short, we found then we could do as well with timothy or lue grass, which do not grow here at all. The doses seem to us nearly identical for practically all working purposes.

We have also been greatly puzzled at the occurrence of another singular phenomenon which we ave not seen mentioned elsewhere and which has greatly disturbed our preconceived ideas of individual pollen specificity. A number of cases of double grass ragweed sensitiveness, in fact in the majority of such cases who started with ++++ positive skin reactions diagnostically, were tested at the conclusion of grass immunization treatment for both grass and ragweed, the ragweed being done in the usual manner to determine the degree of sensitiveness in order to institute additional specific ragweed treatment with appropriate doses. Much to our surprise, not only in these cases were the grass tests negative, but also the ragweed tests were either correspondingly totally negative, or reduced from a ++++ to a bare +. Treatment which we had expected to start with a 1:5,000 extract, we now found could be safely and easily started with a 1:50 or even a 1:20 extract. Several patients were not given ragweed immunization at all; others were given a few high doses as a precautionary measure. Certainly in this end of the world, a high grass immunity confers total or almost total immunity against ragweed. In the same way, we found carelessweed immunity in primarily carelessweed cases to give a high or total protection against both grass and ragweed.

Why large doses of grass or carelessweed extract afford complete or almost complete protection against a totally unrelated pollen, such as ragweed, we can only conjecture. Nevertheless, clinically, it is a fact. Our limited experience with primary ragweed cases does not give us any information as to whether in turn high ragweed immunization similarly affords protection against grasses.

HANDLING OF PATIENTS SENSITIVE TO MORE THAN ONE POLLEN

We do not use pollen mixtures. Since noting the high protection given by a complete immunization with the primary pollen against all other pollen factors, it has been our custom in all instances to carry our primary pollen immunization through to a conclusion, after which usually only a few doses of high dilutions of any other pollen factors are required. In many instances no other treatment beyond the initial immunization has been found necessary.

SEASONAL TREATMENT

Immunization is not practical in the presence of active hay fever or asthma. Unfortunately, most of our local cases of asthma and many of our hay fever cases are of grass etiology, and are seldom encountered in the two or three months of the year when they are comparatively free from symptoms. Sending patients away to the coast or to some desert section of the West is not always practical. While more difficult to handle in every way, these cases can, more often than otherwise, be cleared sufficiently for immunization purposes. Advantage can be taken of the fact that specific treatment can be administered at any time there is freedom from symptoms between attacks for three or four hours, the method of treatment, doses, etc., being identical with those of the preseasonally handled cases. Extreme care must be exercised to give no treatment in the presence of the slightest active symptoms. Inasmuch as such patients must perforce receive naturally an unmeasurable amount of air borne pollen at home or on their way to the office, the dose of pollen extract administered by the hypodermic needle does not represent the actual dose received. Also, it is impossible at times to state when a patient is one hundred per cent. clear of symptoms, and at other times it is impractical for a patient to remain a sufficient length of time in a closed up office to secure perfect clearing, and

chances have to be taken. Hence in these cases, reactions both cutaneous and general, are comparatively frequent, few patients escaping at least one or more mild constitutional reactions. Relapses are common, and the number of treatments necessary to attain the final protective dose far exceeds what is required in the preseasonally immunized case.

The following general measures will be found ordinarily successful in rendering a seasonal case symptom free. Existence, as far as possible, should be limited to the downtown sections of a good sized city away from contact with empty lot weed or grass growth, and indoors as far as possible, and in rooms on the opposite side of the house from the prevailing winds. In sleeping or working rooms, either no windows at all, or only a single window should be kept open, with all doors or transoms tightly closed, thus avoiding all air currents. An electric fan kept constantly in action day and night in front of the room's only open window prevents the entrance of much pollen, and makes the best pollen screen or filter we have been able to devise or secure. Automobile rides and trips out of the business sections of the city are, of course, forbidden.

In our cases of both hay fever and asthma we advise our patients, if not clear on arising, to take enough epinephrin hypodermically to become so, and to report for treatment within three hours. When patients reach the office not quite clear, we frequently have them wait in a closed room for a half hour or even longer, and then if not clearing sufficiently, administer epinephrin, and have specific treatment administered some two hours later. Patients living in the suburbs remain downtown from early morning until late at night. Such a routine reduces air pollen doses and suffices in all but extremely sensitive cases.

Naturally, it is impossible for all patients to maintain such an existence for any length of time. Instructions are constantly being violated, either through necessity or carelessness, producing a return of symptoms. As protection is gradually raised by interval treatment, larger amounts of air pollen are required to produce the attacks, which necessarily become less and less frequent, and less and less severe. However, such protection is only slowly and gradually induced, and intercurrent periods of high wind velocity increasing the usual pollen content of the air frequently (and usually) bring on a recurrence of symptoms, and repeatedly so, until full immunity has been established.

Also, it is frequently impossible to tell in these cases where epinephrin is being used, when symptoms are due to treatment overdosing or to the inhalation of air borne pollen, as epinephrin may at times mask or modify the guiding skin reaction. Also at times, accidental intravenous medication occurs. It is always safer to ascribe symptoms to overdosing, to resume epinephrin regularly with such relapses, and to wait for an interval of freedom from symptoms before taking up specific treatment again. Thus many disappointing delays naturally occur, and many partial immunizations, before an interval of freedom finally supervenes of sufficient duration to permit the attainment and several times repetition of the ultimate dose, and in our experience, especially with the old chronic perennial asthma cases we so often see here, full immunization is essential to secure relief. Naturally a certain percentage of patients become discouraged and discontinue treatment, or are forced to do so for one reason or other.

We worked on one case of grass hay fever one whole year before securing protection, and on a case of chronic grass asthma three years. Many, probably most of our cases, require from four to six months. In many of these cases, a dose is reached which seems impossible to pass on account of successive reactions, but persistency will usually finally get by. However, we do not doubt that there exists a certain very small percentage of patients whom it will be impossible to immunize at all, but usually from inability to remove them from pollen contact.

In two cases only were we unable to secure sufficient clearing up of symptoms to start immunization treatment where this routine was or could be employed, and it is doubtful if asthma exists anywhere any more severe or persistent than we see it here. By the routine mentioned, we have cleared up in a few days cases that have not been free for months, and also some old severe chronic cases where the patients' economic condition was such that it was absolutely impossible for them to avoid almost constant heavy pollen contact.

TABLE I

CLASSIFICATION OF CASES

	Hay Fever	*Asthma*	*Total*
Allergic cases of respiratory tract seen this year	54	121	175
Allergic pollen cases seen this year	47	68	113
Allergic cases, presumably grass, negative to grass tests	2	22	24

ETIOLOGICAL CLASSIFICATION OF POLLEN CASES

ADDITIONAL SECONDARY FACTORS

Primary Factor		*Carelessweed*	*Ragweed*	*Carelessweed Ragweed*	*Ragweed Mountain Cedar*	*Carelessweed Ragweed Mountain Cedar*
Grass	19	4	54	11	4	5
Carelessweed	6		2		0	
Ragweed	6	2				
Mountain cedar	1	0	1	0		

TABLE II

TREATMENT RESULTS

Finished cases	41
Purely preseasonally treated	11
Seasonally treated	30

	Grass	*Carelessweed*	*Ragweed*	*Grass Ragweed*	*Carelessweed Ragweed*	*Grass Ragweed Mountain Cedar*	*Grass Carelessweed Ragweed Mountain Cedar*
Clear	8	4	2	17	1	3	
Improved	1			3			
Failure						1*	1†

*Intercurrent illness removed case from care though 0.35 c.c. of 1:2 grass extract reached.

†Took country trip before all immunization completed. Did not resume treatment on return.

Perfect results	35	85 per cent.
Marked improvement	4	10 per cent.
Failure	2	5 per cent.

TABLE III

UNFINISHED CASES UNDER TREATMENT

Seasonal	33
Preseasonal	2

	Grass	Ragweed	Mountain cedar	Grass Ragweed	Careless-weed Ragweed Mountain cedar	Total
Clear*	1	2	2	10	2	17
Improving	8			7		15
No improvement	3					3

*Improvement or clearing in these cases (except mountain cedar) considered due principally to pollen precautions and only partially to specific treatment; seventeen other patients started but did not complete treatment, only one attaining a high enough dose to be considered a possible failure. Two cases could not be cleared sufficiently for treatment, two cases undergoing clearing for treatment.

ALLIBILITY OF INTRADERMAL POLLEN SKIN TESTS. HYPODERMIC TESTS

So much has been said regarding the use of the kin tests in the diagnosis of pollen hay fever and sthma, that no detailed mention of the technic of heir employment is here required. The average ommercial diagnostic extracts are of 1:50 strength, nd used intradermally, on the whole, are very satisactory. But they are not infallible by any means, nd were diagnostic tests limited to their use, many case would be missed completely, especially of sthma, but also occasionally of hay fever. We ave had no experience with the ophthalmic tests.

Sensitiveness is a matter of degree and dose. The verage hay fever case will give a definite positive kin test to an extract of his offending pollen with dilution as low as 1:500 or 1:5,000, but not infreuently the sensitiveness is so slight that extracts f 1:50 strength will be negative and at times even f 1:20. Symptoms in these cases are due to the eception of enormous doses of pollen by the natural hannels. That this is not pure theory is shown by he fact that in some instances, treatment can be arried to the point of the complete eradication of the uge positive skin test originally secured with the rdinary commercial 1:50 diagnostic extract, without the slightest benefit to the asthma or hay fever, hich, however, will clear up if treatment is pushed o the use of the large sized recommended doses of 1:20 extract. Our experience with stronger xtracts for testing is too limited for any expression f their value.

We have been able to hold under observation eight f our patients with skin tests negative to all antiens, also seven patients previously considered pure eather or animal hair cases, either fully immunized gainst such factors or under strict precautionary nvironment, all of whom relapsed this fall (fall eing our heaviest pollination season), all with epeated negative pollen tests, thirteen with asthma nd two with hay fever. All gave histories consistent ith a pollen etiology. All these fifteen patients were ut under pollen precautions and treated empirically ith grass extract, on the ground that our most prevlent pollen might have something to do with their ases. Much to our surprise, all gave definite local eactions and occasionally constitutional symptoms t some time during routine grass treatment. Curiusly enough also, a few patients with negative or nsignificant grass tests have given definite ragweed ositive skin tests, but have their trouble also in the spring and summer, at which times our pollen plates show no Compositæ pollen granules. Ragweed immunization has not cleared up or improved these cases without additional grass treatment which has cleared them up.

In these presumably grass cases, five patients, in whom grass immunization has been completed, are free from symptoms. Six have improved to a degree consistent with the amount of grass extract received to date, though our grass season is still at its peak (November 20th), and four only have failed to show any improvement at all, as reactions are blocking all treatment progress.

Where the history of the patient gives the slightest indication of trouble in spring, summer or fall, irrespective of animal hair, food, feather or orris tests, we now test all such negative pollen cases hypodermatically with the following grass pollen extract dosages: 1:5,000, 0.05 c.c.; 1:500, 0.05 c.c.; 1:50, 0.05, 0.1, 0.2 c.c.; 1:20, 0.05, 0.1, 0.15, 0.2 c.c., often getting positives with as low as the 1:500 dilution. We consider no case negative to grass pollen unless the maximum dose mentioned can be reached without reactions. We now put all cases of this type under preliminary grass immunization and routine pollen precautions with very satisfactory results.

In other words, the pollen skin tests are not to be considered absolutely diagnostically dependable. Seasonal history probably justifies prevailing pollen immunization in other sections of the country, even in the absence of positive skin tests. Certainly our local experience justifies this statement. Dr. George Piness of Los Angeles (3), whose pollen problem is similar to ours, has had this same experience in testing with the grass extracts. The hypodermic tests we suggest and which we have not seen mentioned elsewhere, furnish a reliable diagnostic means of checking up these cases and avoiding the error of overlooking actual grass cases of this type. These hypodermic tests are given one each day, with a careful watch for delayed local or constitutional reactions. Our ragweed experience has been too limited to express an opinion as to whether some of its victims also fail to give positive skin reactions.

From the foregoing it can be readily seen that the diagnosis and treatment of pollen hay fever and asthma consist of a great deal more than the application of a few commercial diagnostic tests followed by a stereotyped sixteen or twenty dose course of treatment, not a single dose of which may be applicable to the case at hand. Partial immunity so produced may effect a partial success in forty per cent. or so of cases where there is a short pollination season. This is a far better figure than we were able to secure here for years before adopting the ideas and treatment methods brought forth in this article. This year with little rainfall and with the air seldom free for even part of a day from far heavier pollen content than we have noticed in any previous years, making atmospheric conditions as unfavorable as possible for our work, the actual results have been almost perfect.

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Endocrines in Relation to Rheumatic Fever and Rheumatoid Arthritis

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(*Continued from page 621*)

CARDIAC DISORDERS AND THYROID INSTABILITY

So insidious are the beginnings of rheumatism in childhood, that none can tell the hour of its inception. Would it not be wise then to recognize betimes the diathesis? Is it not somewhat arbitrary of us to refuse to admit its presence until recurring tonsillitis, socalled growing pains or endocarditis give it, what we are pleased to term, an authentic stamp? The more so in that—despite the readiness with which children's temperature rises—their rheumatic manifestations are so often apyrexial. Thus both carditis and endocarditis are frequently from beginning to end afebrile,[1] and their refractoriness to salicylates is notorious. But even those wearisome cases in which endocarditis and joint swelling in a child drag on, defiant of salicylates, I have known clear up on the addition of cautious thyroid therapy.

That cardiac affections in children should run an afebrile course is very striking, but indeed, it appears to be a feature also of endocarditis in the rheumatic fever of older subjects. For as Sir Archibald Garrod long since pointed out, the incidence of endocarditis "has very little effect upon the curve." This is the more striking in that pericarditis causes a sharp rise. That endocarditis or carditis occasions little or no disturbance of the temperature would seem—as I have before suggested (2)—to predicate some local and specific difference in the pathological or biochemical reaction of these nonstriated muscular structures to the casual virus. Instinctively one recalls the controlling influence on the body temperature exerted by the thyroid and other endocrines. Thus, the temperature in myxedema or hypothyroidic subjects is commonly subnormal, but in Graves's disease and hyperthyroidism often a degree above normal. Now, seeing that children of rheumatic stock are often hypothyroidic, one can scarcely resist the inference that this thyroid deficiency is in some way responsible for the often apyrexial character of carditis and endocarditis in their instance.

Moreover, since the muscular and fibromuscular lesions in endocarditis are—as Ivy Mackenzie suggested—not incompatible with "a process of perverted metabolism of the muscle substance"—is it not conceivable that thyroid deficiency may occasion such perversion, with resulting myocardial degeneration. For, diminished thyroid secretion implies diminished tissue oxygenation, lessened katabolism, and inadequate elimination of waste products. Might not such metabolic obliquities be at the roo of the insidious apyrexial installation of carditis o endocarditis in a child?

Huchard has indeed suggested that congenita mitral stenosis may be the outcome of congenita thyroid deficiency, and we know, too, that in myx edema the cardiovascular system is severely involved The muscle fibres are infiltrated with fatty an mucuslike substances, while coincidently the vessel tend to undergo arteriosclerosis. Klippel has pointe out also that sometimes mitral stenosis coexists wit myxedema, and it is possible, too, that the retarde development of children with mitral stenosis ma hark back to a subthyroidic substrate.

RELAPSING ENDOCARDITIS AND AUTOSENSITIZATIO

The hypothyroidic substrate of the rheumatic chil with its correlated tendency to periodical phases o hyperthyroidism may be in part etiologically respon sible for recurrent or relapsing endocarditis. For, re calling the existence of organ specificity, I have else where suggested that in autosensitization we migh possibly find a clue to the source of relapsing endo carditis, viz., alternating phases of sensitization an desensitization.

Now, these reactive phases of hyperthyroidism ar presumably compensatory. But nevertheless, suc may determine attacks of migraine, asthma, derma toses, etc.—currently regarded as due to anaphylaxis Now, there seems no *a priori* reason why the cardia organ should be immune from the effects of suc periodic hypersecretion. Rather the reverse, seein that tachycardia is so cardinal a feature of hyper thyroidism. May it not be then that the cardia lesion is kept going by the periodical influx into th blood stream of an excessive and it may be also a pe verted thyroid secretion, viz., autosensitization or en dogenous anaphylaxis. As I have elsewhere re marked (4) the afebrile character of carditis an endocarditis in children is a feature more compatibl with an anaphylactic than an infective origin. Th relapsing nature of the endocarditis would on thi hypothesis be due to a series of mild anaphylacti poisonings.

But on this hypothesis, it would at first sight ap pear irrational to suggest thyroid therapy. Albei not if we recognize that the basal condition is one o hypothyroidism, or more correctly of thyroid insta bility. Hence our aim is to restore the endocrin balance—to inhibit the periodical phases of hyperth roidism and this by tentative thyroid therapy. Fo seeing that refractory joint swellings undergo rapi regression—if to salicylates be superadded thyroi therapy—then why should not the heart—a viscera joint—when the seat of carditis or endocarditi prove equally amenable, and my experience suggest that it is.

Albert Kocher, of Berne, wrote recently "hypo

[1]The controlling influence on the body temperature exerted by the thyroid and other endocrines, especially the adrenals, may possibly throw light on the marked differences obtaining between the rheumatism of childhood and that of older subjects. In nothing is the difference more marked than in this matter of temperature. The insidious chronic and often apyrexial character of rheumatism in childhood contrasts sharply with the acute fulminant pyrexial rheumatic fever of those past puberty with its further complication—fortunately rare—hyperpyrexia. In view of the regulating influence of the thyroid on the body temperature, is it not possible that thyroxin or some other hormone—capable of intravenous administration—may prove helpful in subduing the pyrexia.

hyroidism is not yet sufficiently known, very often evere rheumatism . . . and heart trouble of unknown origin are due to hypothyroidism and cured by transplantation of thyroid tissue. This is the nethod of choice in these cases as thyroid feeding often causes stomach trouble and is never carried on ong enough."

May I ask, is not the carditis of children also a "heart trouble of unknown origin"? How well nigh mpotent are we when confronted with relapsing carditis or endocarditis! Salicylates fail us and we fall back on rest and a pious hope in the *vis medicatrix naturæ!* Knowing full well that even if recovery takes place it but too often leaves as a legacy immutable if not progressive organic lesions. Surely cautious thyroid therapy may well be given a trial. A trial—tentative as it always should be—but if it occasion palpitations or precordial pain it is not necessarily a signal for discontinuance. For, as Hertoghe has shown, such disquieting symptoms may ensue in a subthyroidic subject on thyroid therapy owing to rapid dissipation of infiltrating substances from the cardiac muscle. So rapid is their disappearance that the heart requires time to readjust itself to the altered musculature, this it does if the recumbent position is maintained and the thyroid dosage be appropriate, and in this matter every patient is a law unto himself. Kocher, as we see in "heart trouble of unknown origin," favors the somewhat heroic expedient of a thyroid graft. It may be that we yet come to this—a small price to pay if we could control or happily arrest the too often progressive cardiac lesion with its Nemesis—organic heart disease!

THE RELATIONSHIP OF THYROID DISORDERS TO RHEUMATIC FEVER

As West long since observed, a previous history of rheumatic fever crops up with suspicious frequency in the victims of Graves's disease. It was so in a series of cases of exophthalmic goitre that I recorded in 1904, viz., rheumatic fever, tonsillitis and sore throats figured largely as antecedents. More recent observations, too, by McCarrison and others clearly indicate that rheumatic fever in some way predisposes to the development of Graves's syndrome which may indeed evolve directly out of a thyroiditis installed during the course of the former malady. Again, tenderness of the thyroid or a subacute thyroiditis has been observed also in chorea and unquestionably the latter disorder has affinities with Graves's syndrome. One may note, too, despite its disputed etiology, that acute thyroiditis has been observed in a child suffering from erythema nodosum.

But interest centres chiefly upon the frequency with which thyroiditis—acute or more often subacute—arises in rheumatic fever. Originally remarked by—I believe—Vincent of Val de Grace our French confrères attach diagnostic importance to tenderness of the gland in this connection. Often, however, the thyroid swelling passes unnoticed as the victim—naturally preoccupied with his arthritic pains—rarely calls attention to the "tenderness" of his neck—an indication for routine palpation of this region, in rheumatic fever. Often, too, the thyroid implication is wholly masked so that its occurrence is only retrospectively diagnosed in light of the symptoms of hypothyroidism which supervene later and this far more commonly than is generally realized. On the other hand, the thyroid may be profoundly disorganized as in a case recorded by Marfan in which a state of myxedema evolved directly out of an attack of "acute rheumatic fever with angina."

It may be postulated then, that rheumatic fever induces a predisposition to Graves's disease or on the contrary and more often determines or is followed by a state of hypothyroidism. Now, most authorities agree that rheumatic fever is distinctly hereditary and not seldom attacks several members of the same family. What then is the nature of the morbid potentiality transmitted, and what also is the medium whereby its hereditary transference is secured? The answer to this etiological riddle—I submit—resides in this association of rheumatic fever with Graves's syndrome on the one hand, and hypothyroidism on the other.

Now, hereditary susceptibility with a tendency to familial distribution is characteristic of Graves's disease. In states of hypothyroidism also, hereditary transmission is the rule. Hypothyroidic women bear hypothyroidic children. In short, thyroid instability is transmissible—glandular heredity.

The phenomena of rheumatic fever and thyroid instability being so intimately interwoven, I would proffer this suggestion, that the hereditary transmission of these endocrine defects and chronic joint disorders may yet prove the basis of the arthritic diathesis so beloved of our forefathers—and the means whereby its hereditary transference is ensured.

RHEUMATIC FEVER AND THYROID INSTABILITY

All the foregoing data seem indicative of some interrelationship between rheumatic fever and thyroid instability. I use the term instability advisedly. For does not the very frequency (sixty-eight per cent. Vincent) with which reactive swelling of the thyroid occurs in rheumatic fever seem to postulate some latent thyroid inadequacy. Freund noted that such reactive swelling of the thyroid in pregnancy is much more common (ninety per cent.) in women residing in goitrous regions. In other words, the strain of pregnancy unmasked the latent thyroid insufficiency. In like fashion, may it not be that an attack of rheumatic fever makes manifest a latent or preexisting thyroid defect, i. e., hypothyroidism?

Doubtless the thyroid reaction in rheumatic fever is defensive for, be it noted, if the glandular swelling be fleeting or absent the disease displays a vicious tendency to chronicity. Have we not here a tacit indication that the determinants of rheumatic fever—microbic or other—favor a hypothyroidic soil, as the less marked the defensive thyroid reaction the more virulent and unrestrained appear to be the morbid effects.

RHEUMATIC FEVER AND HYPERTHYROIDISM

While it would appear probable that rheumatic fever develops by preference on a subthyroidic substrate it seems legitimate to assume that the reactive swelling of the thyroid is compensatory—an effort to restore endocrine equilibrium. For viewing the clinical syndrome of rheumatic fever, how reminiscent its general symptoms are of hyperthyroidism!

Thus, in both conditions we get quickened pulse, profuse sweats, fever, hyperglycemia, and diminished

calcium content of the blood. True, as Vines observes, these same symptoms may also be the expression of sympathetic excitation in response to infection. Nevertheless, how well nigh impossible it is to differentiate sharply the symptoms of hyperthyroidism from those of sympathetic excitation! Seeing how intimately interwoven are the thyroid and adrenal sympathetic system—the thyroid stimulating and in turn being stimulated by the adrenals.

But even if we take the more restricted view upheld, e. g., by McCarrison, viz., that the symptoms of pure hyperthyroidism are "loss of weight, gastroenteritis, diarrhea, and an increase in pulse rate proportionate to the increase in metabolism," the supposition that hyperthyroidism plays a part in the symptomatology of rheumatic fever is still tenable.

For certainly quickened pulse and rapid wasting are present while gastroenteric derangements are salient features both in the rheumatism of childhood and rheumatic fever. Thus, Poynton on this point states "children of rheumatic parentage are liable to attacks of bilious vomiting, with white constipated stools, and at the commencement of an acute attack vomiting and diarrhea, with much mucus in the stools may occur, while in adults, severe gastric pain with vomiting and diarrhea, or attacks of pain along the colon, may add greatly to the severity of the disease."

The presence then of symptoms suggestive of hyperthyroidism seems fairly assured, and there is, I think, evidence also of associated sympathetic excitation. To begin with, we have hyperglycemia and diminished calcium content of the blood—features common to both rheumatic fever and Graves's syndrome. In light of this, visualize for a moment the clinical picture presented by rheumatic fever plus a swollen thyroid. The quick pulse is there, the profuse sweats and wasting, as well as the enlarged thyroid, and if to these were but superadded proptosis and tremor, we should straightway be confronted with the coexistence of rheumatic fever and Graves's syndrome. An assumption not so improbable when we realize that Graves's disease has been known to evolve directly out of a thyroiditis installed during rheumatic fever. This overlapping of the two syndromes seems to confirm my supposition that the heightened excitability of the sympathetic system—so distinctly a feature of Graves's syndrome—also obtains in rheumatic fever. This the more likely in that it is well recognized that Graves's complex frequently—after a variable interval—follows in the wake of rheumatic fever. Or, failing this, that symptoms of hyperthyroidism—quickened pulse, wasting, and gastroenteric disturbances, e. g., colitis, dilatation of stomach—may persist after the close of rheumatic fever—as judged by the regression of articular symptoms and may indeed be the interconnecting link between relapses of the disorder.

Meanwhile, however, we must not lose sight of the fact that while Graves's syndrome, or a condition of hyperthyroidism may follow rheumatic fever, a much more common sequel is a state of hypothyroidism. Nevertheless, this, too, does but strengthen the supposition of endocrine—sympathetic implication as an integral part of the syndrome rheumatic fever. For given that a state of hyperthyroidism obtains during rheumatic fever, it may readily happen that—through functional exhaustion of the gland—a condition of hypothyroidism may subsequently ensue.

To sum up, thyroid instability in rheumatic fever apparently involves three phases. Preexisting latent or avowed hypothyroidism giving place during the disorder to a phase of reactive hyperthyroidism with as a sequel either Graves's disease, continued hyperthyroidism, or more often hypothyroidism.

THE ARTICULAR LESIONS OF RHEUMATIC FEVER

The question now naturally obtrudes—what of the joint swellings? How do they accord with these views, and here I would revert to the differences—*qua* joint involvement—between the rheumatism of childhood and the rheumatic fever of later life.

In the former, joint swellings are relatively rare, and even when present usually amount to nothing more than a light puffiness of wrist, ankle, or knees which recalls Goodhart's observation that rheumatic children were prone to tetany. Now, this disorder is sometimes complicated by periarticular swellings whence the term rheumatic tetany. This appellation, however, is now looked at askance and the joint swellings not classed as rheumatic, but referred to "vasomotor and trophic disturbances of innervation."

Now seeing that articular rheumatism in childhood usually connotes simply edema over one or two joints, is there any *a priori* reason why these should not likewise be of vasomotor and trophic origin? I know of none, and turning to the widespread joint swellings of rheumatic fever similar doubts intrude. Does not the fleeting nomadic nature of the lesions—the very completeness despite repeated swelling and retrocession—of their *restitutio ad integrum*—seem to indicate that some special mode of pathogeny is responsible for these vagaries—so alien to streptococcal and other infective arthritides.

Salicylates, too, in the latter are impotent, and as Ivy Mackenzie observes there is "no instance of infection outside the protozoal group yielding to a drug of this kind." Do not these peculiarities instill a doubt as to whether the joint swellings are not arthopathies rather than arthrites? That if of infective origin, they are not directly so—but indirectly—the intermediary mechanism being some instability of the vasomotor centres affiliated to the neuroendocrine system induced secondarily to infections or other agencies.

Does not the symmetry also of the articular lesions—at least in the serial sense—seem to predicate the intervening of some central controlling influence? Does not also the invasion and reinvasion of individual joints savor something of the paroxysmal or periodical—something reminiscent to my mind, of that curious disorder, intermittent hydrarthrosis? This latter seems linked up with thyroid insufficiency. It has been met with in goitre—it almost always disappears during pregnancy which is suggestive of autothyroid therapy—a supposition the more plausible in that similar results have followed in the nonpregnant after thyroid treatment.

Now, as I have remarked, rheumatic fever—when rebellious to salicylates—relents if thyroid be superadded. Moreover, it is somewhat remarkable that though rheumatic subjects—as evidenced by cardiac disorders—often become pregnant yet—(if we ex-

cept chorea gravidarum) I have—despite wide search in standard works—failed to find one recorded instance of rheumatic fever occurring during pregnancy. Has the thyroid hypersecretion during pregnancy anything to do with this immunity? For the immunity ceases with the delivery as, according to some, rheumatic fever not infrequently arises in sequence to prolonged lactation.

This apparent immunity from rheumatic fever during pregnancy—in itself arresting—is enhanced in interest in that a like freedom is enjoyed often (while pregnant) by the victims of migraine, asthma, Raynaud's disease and angioneurotic edema. For all these disorders are apparently the outcome of vasomotor and secretory disturbances of neuroendocrine origin. The which is interesting in light of my suggestion that the joint swellings of rheumatic fever may be of similar genesis.

But if of vasosecretory origin, how is it determined? Now, Hertoghe and others have noted that excessive thyroid therapy sometimes determines fleeting articular swellings and pains. Indeed Levi and Rothschild hold that the joint lesions thus produced may be difficult to differentiate clinically from those of rheumatic fever. But is it not true also that the joint swellings in rheumatic fever—though rebellious to salicylates—are dissipated by combined salicylates and thyroid therapy?

These findings at first sight seem paradoxical. But not so if in rheumatic fever we have regard to the correlated thyroid in stability, viz., a basal hypothyroidism associated with reactive phases of hyperthyroidism. For under such conditions of imbalance tentative thyroid therapy—by restoring endocrine equilibrium—may inhibit the tendency to paroxysmal thyroid hypersecretion. Indeed, the swift rise and wane of the joint swellings—their flitting from place to place—seem to predicate synchronous variations in the causes operative. Hence my suggestion that they may be due to phases of hyperthyroidism with its correlated sympathetic excitation, and these again in turn due to concomitant fluctuation or intermittency on the part of those agencies—microbic or other—that tend to inhibit the functional activity of the thyroid.

That endocrines other than the thyroid are concerned is certain, for with the advent of puberty, genital hormones come into play, and the intimacy of their functional correlation with the thyroid and of both with the adrenals need not be labored. Moreover, we know the reversible interactions of the thyroid and adrenals and their close relationship with the sympathetic system, of which the latter are indeed an integral part.

Seeing therefore how important a rôle the efferent sympathetic fibres to a limb play in regulating the blood supply to the skin and deeper structures as well as the cutaneous secretion, is it not conceivable that instability in the exercise of this function might occasion local circulatory and secretory disturbances in the joint structures. Not so improbable when we realize that one of the most striking peculiarities of the subthyroidic rheumatic child is their state of vasomotor ataxia or instability—with its correlated liability to dead fingers or even actual Raynaud's syndrome—which latter again, may, like tetany, be complicated by fleeting joint swellings or effusions.

One may indeed well ask, what is the inward significance of this overlapping of tetany, Raynaud's syndrome, rheumatic fever and Graves's disease? Tetany and Raynaud's disease we realize are linked up with subthyroidism or thyroparathyroid defect, but why, when we touch on the endocrine affinities of rheumatic fever, content ourselves with the bald statement that it apparently predisposes its victim to Graves's disease.

For, does not the very fact that Graves's syndrome may arise forthwith out of rheumatic fever clearly postulate that the innate morbid potentialities that make for the former are inherent in the victim of the antecedent rheumatic fever. In short, that rheumatic fever does not so much predispose to Graves's disease as that both these syndromes, like tetany and Raynaud's complex, hark back to a common etiologic substrate—subthyroidism, of which they are presumably but clinical variants.

Indeed, judging by its affinities for endocrine disorders it does not seem inconceivable that rheumatic fever itself also may be a neuroendocrine syndrome evoked by infections, possibly in the tonsils, but more probably in the gastrointestinal tract. Possibly, as has been suggested in regard to Graves's syndrome (McCarrison) to toxic products released through the action of anaerobic bacteria on proteins or amino acids, which through their action on the thyroid and adrenal sympathetic evoke Graves's syndrome. Seeing then that Graves's syndrome may in some cases be apparently but an extension, as it were, of rheumatic fever, why should not the same factors be at work in the latter disorder? For this much at any rate is certain, that enucleation of the tonsils confers no immunity from rheumatic fever nor freedom from recurrence of the same when previously suffered from.

GASTROINTESTINAL INFECTIONS

The gastroenteric crises, vomiting, diarrhea, that sometimes mark the onset and so commonly punctuate the course of Graves's syndrome, are somewhat strikingly paralleled in the rheumatism of childhood and in rheumatic fever.

In children, vomiting and diarrhea with much mucus may usher in acute rheumatism, while their tendency to periodical vomiting and mucous colitis is well recognized. Again, vomiting and diarrhea with severe pain are common in rheumatic fever, the diarrhea may alternate with constipation and as in Graves's syndrome mucous colitis and dilatation of the stomach are not uncommon.

Now, we know that thyroxin is a derivative of the amino acid tryptophane, the disruption of the latter being achieved by the putrefactive or indole producing bacteria. Normally only a certain percentage of tryptophane passes to the thyroid, the remainder being decomposed in the intestine by the indole producers and passing out in the urine in the form of indican and organic sulphates.

Now, D. J. Harries's researches show that the absence of indican from the urine indicates the absence of indole producers from the intestine. Under these conditions the whole, and not the usual moiety of the tryptophane is absorbed and available for thyroxin formation. Harries finds that with the disappearance of indican and organic sulphates from the urine, the familiar syndrome of hyperthyroidism ap-

pears. Accordingly, he deems Graves's syndrome due to excessive absorption of tryptophane following the disappearance of indole producers from the intestine, and he holds therefore that the early disappearance of indican from the urine in exophthalmic goitre is of serious prognostic import.

Now, seeing that Graves's disease may arise directly out of rheumatic fever it would seem desirable that this latter disorder also, should be investigated from this point of view, viz., the absence or not of indican in the urine. I proffer this suggestion inasmuch as I can find no reference—neither in standard textbooks nor special monographs on rheumatic fever—to the presence or absence of indican in the urine. Should research on this point establish absence of indican, it might explain why a too early resort to meat broths so often occasions a relapse in rheumatic fever. For in Graves's disease Harries finds that in the complete absence of indican and therefore of putrefactive organisms, administration of meat aggravates the symptoms. Lastly, the gastrointestinal derangements in rheumatic fever call for bacteriological investigation in view of their possible etiological relationship to the disorder.

RHEUMATOID ARTHRITIS AND ENDOCRINE DISORDERS

Vincent Coates and Gordon—discussing the etiology of rheumatoid arthritis—remarked that "A history of rheumatic fever seems to occur more frequently than can be accounted for by the incidence of this disease in the general population." With this I thoroughly agree, and seeing the intimate association of rheumatic fever with Graves's disease and still more with hypothyroidism, is it not highly significant that in rheumatoid arthritis also we find again this same intimate relationship, viz., with Graves's syndrome and hypothyroidism. In 1904 I recorded fourteen examples of the complete and six of the larval or incomplete type of Graves's syndrome coexisting with rheumatoid arthritis. A previous history of rheumatic fever, rheumatism, tonsillitis, sore throats was elicited in no less than twelve cases. Fourteen suffered also from Raynaud's disease in their extremities, in two the Graves's syndrome antedated the rheumatoid arthritis. In the majority the two arose concurrently, but in one or two Graves's disease was engrafted upon a preexisting rheumatoid arthritis. In one instance in which Graves's syndrome preexisted recession of the thyroid swelling was quickly followed by the installation of rheumatoid arthritis. Hence my suggestion that in cases of rheumatoid arthritis "with apparently atrophied thyroids and possibly in others some benefit might accrue from thyroid administration." In addition I have recorded examples of the coexistence of Graves's disease, rheumatoid arthritis and partial or complete myxedema, while the coexistence of rheumatoid arthritis with minor signs of hypothyroidism, sometimes with goitre, is not uncommon.

INTERCONNECTING SYNDROMES

In the case alluded to above it is significant that during the period intervening between the thyroid recession and the subsequent rheumatoid arthritis, the patient developed Raynaud's disease—this forming, so to speak, an interconnecting syndrome, and in my work on *Arthritis Deformans* I emphasized the extreme frequency with which such vasomotor phenomena preceded rheumatoid arthritis (5). The Raynaud symptoms often develop quite suddenly after some infective or toxic disorder—rheumatic fever, tonsillitis, influenza, gastrointestinal derangements, etc.—to be complicated in a few weeks or months by joint swellings. In some examples originating in alimentary disorders or after pregnancy or prolonged lactation, the interconnecting syndrome was that of tetany (6). The latter is clearly an indication of thyroparathyroid deficiency, and, as I believe, the Raynaud's syndrome also, viz., as previously suggested, they hark back to a common subthyroidic substrate. The paroxysmal incidence of the Raynaud phenomena may be due to reactive phases of hyperthyroidism, or possibly—so intimate is the thyroadrenal association—to phases of hyperadrenalinemia. I can vouch for the efficacy of thyroid therapy in Raynaud's syndrome, but good results have also followed adrenal treatment. Again, both thyroid and parathyroid have been found useful in tetany, and rheumatoid arthritis. Other interconnecting syndromes to be mentioned are migraine and asthma. The former often disappears with the onset of rheumatoid arthritis. Asthma often, too, but I have seen the bouts of asthma alternate strikingly with remissions and exacerbations of the joint swellings in early rheumatoid arthritis.

(*To be concluded*)

Milk Parenterally in Arthritis

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Since Schmidt and Saxl (1), in 1916, pointed out the protein reaction following the intramuscular injection of milk, many workers in all parts of the globe have applied this means of therapy to various diseased states. Bessau (2) and Mueller (3) affirmed that the reactions were due to bacterial content, but Uddgren (4) in 1918, working with sterile milk, found similar but milder reactions. More recently, hundreds of observers have studied the reaction and the effects, and though not universally obtained, nearly all agree that certain desirable effects are produced. The application to arthritis itself, and the partial understanding of nonspecific protein therapy and the protein reaction followed. R. Müller (5) in 1918, A. Weiss (6) in 1919, Schulman (7) in 1920, Eidelsberg (8) in 1922, among others, pointed out more or less frequent improvement in arthritis, acute, subacute, and chronic. During this time, it became conclusive, that salicylates failed in many cases, that diet restriction and diminished car-

bohydrate intake helped many, that proteins of various kinds parenterally helped others, that removal of apparent foci of infection frequently aided or cured, but just as frequently failed dismally, and so on. This brought up the question, why do we obtain

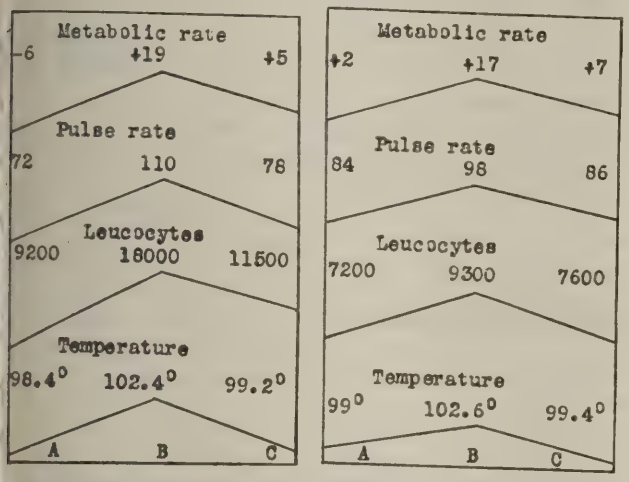

FIG. 1.—Examples of changes in temperature, leucocytes, pulse rate, and especially metabolic rate. (Cases G. L. and R. T.) A, at injection; B, after eight hours; C, after twenty-four hours.

the same effect with such widely different methods of therapy? Why does injection of milk in one case, and administration of thyroid in another, give decrease in pain and increase in function? Why, following any operation or a fatiguing journey, or an intercurrent infection, does a remission occur?

I can but refer to several of the numerous explanations and theories, summarized by Peterson (9), e. g., Weichardt's theory, selective stimulation, Wolf's theory, and many others.

As to removal of foci of infection, an evident state of affairs presents itself. The patient enters the scene with numerous joints swollen and distorted. The tonsils or teeth, the appendix or gallbladder, or what not, are studied and found infected. These foci are removed, and the condition remains the same. Each joint, and in one case as many as twenty, thirty or more separate joints are involved, each a secondary focus of infection, and each left remaining, to reinfect new joints, and form still more foci. Obviously then, we are unable to do more than scratch the surface of the sites of infection, and the patient progresses, only too often, from bad to worse. By this time the damage is so severe, the atrophy is marked, ankylosis, new bone formation, and the invalidism is so severe, that cure is out of the question. Then metabolic changes have appeared, as well as decreased sugar tolerance, decreased metabolic rate and other changes. Consequently, though the removal of foci of infection will and must be practised, we must search further to better our therapeutic armamentarium.

In 1921 I showed (10) that often, following injections of milk intramuscularly, there was a reduction in blood sugar level, which to begin with frequently was somewhat above the normal. Pemberton (11) had already pointed out that many cases of arthritis were associated with a definitely decreased sugar tolerance, and also showed how removal of a focus of infection, if followed by improvement or cure, was associated with an increase in sugar tolerance, the curve approaching the normal.

We then turned our attention to the study of the relation of what Pemberton showed, and our observation of the decrease in blood sugar level in many cases of arthritis, following the injection of milk. In cases showing improvement, if a decreased sugar tolerance existed, an increase in tolerance often went hand in hand with the improvement. Incidentally, the lack of uniformity in results, and the often peculiar curves, must be accounted for in part, at least, by the hurried or delayed sugar absorption in some cases, and the presence of metabolic or endocrine diseases in others, which would of course upset the curves. (Fig. 2.)

In the light of this, we can have a rational explanation of the low carbohydrate intake and our restricted diet, and among other things, of how milk parenterally aids arthritis.

Then, why the frequent observation of improvement following an intercurrent infection, as fever, a long journey, any excitement, administration of potassium iodide or thyroid substance, and now thyroxin? Pemberton suggests (11) that these measures, among others, hasten the body metabolism. What is the effect on the metabolic rate of milk administration parenterally? As it was expected, the injections frequently gave a fever, more or less severe, often absent, an increase in pulse rate, also often absent, and frequently an increase in the metabolic rate. The cases showing the combination of fever, leucocytosis, increased pulse rate, and an increase in the metabolic rate invariably gave the best results. (Fig. 1.)

These are only several of the ways and means of the action of proteins and other substances producing socalled protein shock, but they help to explain the enigma, and remove some of the empiricism hitherto associated with this form of treatment.

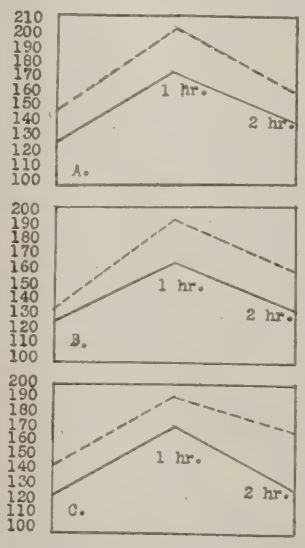

FIG. 2.—Examples of changes in sugar curves. A, Case G. A., received fourteen injections. B, Case R. T., received twelve injections. C, Case P. V., received six injections. Dotted line, before treatment; unbroken line, after six to fourteen injections.

We have given in all since 1920 several thousand (two thousand six hundred) injections, in about two hundred and fifty cases. One is too often disappointed by the results, but then how often do all our methods of procedure and therapy fail us. Even progression is sometimes not halted. Five cases have definitely regressed from what one would term an advanced state, fourteen patients, mostly early cases (five to ten months' duration) have been cured—107 patients improved in varying degrees—a number have ceased progression, even though not improved—and many, many failures. Too often the pathology is extensive, the disease extremely malignant

and progressive in nature—frequently associated with endocrine and metabolic disturbances, ankylosis, atrophy, exostoses, and what not—and cure out of the question. The underlying pathology remains —really unaffected. Any improvement, any aid is welcome. Cures are not to be thought of, and should never be promised. Then, and then only, is any improvement welcome and any aid a blessing.

CONCLUSIONS

1. An explanation of why removal of foci of infections fails to aid many cases of arthritis is discussed.

2. An explanation of why all forms of treatment fail in many cases is suggested due to secondary metabolic and endocrine changes, and too extensive pathological changes.

3. Observations have shown a decided increase in sugar tolerance in arthritis following milk injections.

4. Following milk parenterally there is an increase metabolic rate in many cases, associated with the improvement.

240 WEST SEVENTY-FIFTH STREET.

References will appear in author's reprints.

Aftereffects of Tonsil Operations

THOMAS M. STEWART, M.D.

Cincinnati, Ohio

The mistaken idea prevails that removal of tonsils is followed by a cure, or at least by great relief, of a large number of diseases. It is also the mistaken belief of most physicians that total removal of the tonsil by a cutting operation is the only thing to do.

The late Dr. Makuen, one of the best throat specialists, in the NEW YORK MEDICAL JOURNAL of March 11, 1916, says: "Some of my best results in tonsil cases have been obtained by merely opening several crypts. This and enlarging their openings will remove serious and constant sources of infection." Dr. Makuen wrote the foregoing before we had perfected the use of the high frequency technic in reducing in size large tonsils, and sterilizing tonsil tissue so that abnormal conditions were done away with. Therefore the tonsil operation with the knife is not the only way to get rid of tonsil infection .

Dr. Makuen also said in the same article that: "A tonsillitis is not a local disease. It is a local expression of a systemic condition. To remove tonsils for a recurring tonsillitis, would be like removing the entire walls of the throat to guard against a recurring pharyngitis."

The question has been asked: "Does rheumatism return after tonsils have been removed?" The answer is yes. The reason for this can be proved from Guy's Hospital Report, 1923. Thirty-five recurrences of acute rheumatism were reported following sixty-six operations on children's tonsils. And there were only thirty-three recurrences in seventy-eight cases in children on whom no operation was done.

May this be an exceptional record of recurrent rheumatism after removal of tonsils? The record is not exceptional for another series of ninety-six cases of which fifty cases had their tonsils removed, and rheumatism returned in twenty-three of them. And no operation was done in the remaining forty-six cases and recurrence occurred in but fifteen of them.

It may be asked: "Of what benefit is the tonsil operation in second attacks of rheumatism?" The answer is: "Of none whatever." Why? Because in another series of forty-eight cases reported by Guy's Hospital, sixteen of them had their tonsils removed and recurrences were noted in twelve. No operation was done on the other thirty-two, and recurrences occurred in only eighteen.

This shows that the tonsil is of some value to the human body. Recurrent attacks of the very things for which removal of the tonsils is strongly advised do occur. And these recurrences are more frequent in patients from whom the tonsils have been removed than in the cases where the tonsils remain.

It might be well to correct another wrong conclusion and that is the effect of the tonsil on the heart.

Dr. Davis (1), of Roanoke, Va., says that, "In seven thousand five hundred cases of diseased tonsils and adenoids in school children, heart disease occurred in but a small number; and that gland glands occurred just as often after as before the tonsils were removed."

Dr. St. Lawrence (2) states that: "A second tonsil operation was required in twenty-two per cent. of my cases referred to throat specialists for operation."

It has been shown after an analysis of many hundreds of cases that removal of the tonsils cures only about half of the cases of mouth breathing, quinsy and sore throat.

In many thousand cases studied by Dr. Kaiser, of Rochester, N. Y., it has been shown that removal of the tonsil does not prevent diphtheria.

Dr. Clendenning, of Kansas City, Mo., says, "lung abscess frequently follows removal of the tonsils. It is sometimes fatal, always serious, and often very crippling."

The Chief Medical Examiner (3) of the Philadelphia schools warns against the snap judgment of school nurses. He says: "Each individual case must be judged solely on the condition present in that case."

The tonsil operation is not a trivial operation because alarming hemorrhage is frequent, and deaths are not reported as in any way due to tonsil operations from my own investigation of returns from seventy-one cities in the United States.

To prove further the seriousness of tonsil operations, Dr. Sheedy (4) says: "Of one hundred cases examined months after operation, more than eight per cent. of the patients had deformed throats. C

these eighty patients, thirty-four complained of speech defects for from one to three weeks after operation; sixteen for more than three months; while four had lost permanently their singing voice. Only twenty-five per cent. of the patients stated that their throats felt better, and that they could speak and sing better after operation than before. Inability to use certain words had continued with five per cent. of the patients for more than six months after operation."

The causes for the ache in joints, sore throat, cough and other troubles either after a tonsil operation or in cases in which the tonsils still remain, are very often due to faults in diet. Errors in diet are a frequent cause of disease.

Frequently it has come to my attention, after patients have been overpersuaded "to have tonsils removed," that the same general trouble persisted. The teeth would be removed and in desperation, the patients have returned to me for advice.

Investigation revealed, for example, that one patient had followed our explanation as to variety in diet and the drinking of more water, but fruit was eaten daily. Now fruit taken daily, even in variety from day to day, is not tolerated by some people. Stopping fruit daily, that is skipping a day, removed the trouble in the joints.

Another patient had had our treatment but he was persuaded "to have the tonsils out, as the only sure way to get rid of the infection." He was operated upon. No improvement followed. Then the teeth were removed and no improvement followed. In addition to the joint pains he had a pain in the region of the gallbladder, a constant ache.

A gallbladder operation was advised; but before it was done the patient returned for our advice. Inquiry revealed the fact that he ate oranges one day and grape fruit the next day, thinking that this was variety so far as fruit was concerned. In other particulars he was all right, except that he ate a boiled egg every morning.

We advised and explained again variety in diet, and warned against an egg daily. The result was "uncanny" to quote the patient. In other words his trouble was dietetic, and he had had a tonsil operation and dentist work that he did not need.

In the words of Dr. Curran: "No one is justified in taking a greater risk when a lesser one may be successful, especially if it will not add to the danger of relieving the trouble with the greater risk later in case of failure."

Therefore our point is, why not first treat the tonsil by the aid of high frequency currents and the x ray? Then if the necessity arises, operation may be done.

In either case false hopes as to the aftereffects must not be encouraged.

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901 Union Trust Building.

Indicanemia

GUSTAV BAAR, M.D.
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This report is based upon ninety-eight cases examined at the clinic of Professor Wenckebach, at the Allgemeine Krankenhaus, Vienna. One hundred and twenty-six analyses were made for residual nitrogen in the blood and for indican in the blood, simultaneously with the determination of the nitrogen and the indican contents of the urine. The nitrogen in the urine as well as in the blood was determined after the Kjeldahl method, the indican determination in the blood as well as in the urine was made according to the quantitative colorimetric method of Jolles.

The cases comprise: two of acute nephritis; seven of chronic nephritis; seven of nephrosis; thirteen of nephrosclerosis, two benign, and eleven malignant; one tuberculosis of the kidney; twenty passive hyperemia of the kidney; three of uremia, one of hypertonia; one of hypernephroma; total: fifty-five kidney cases. There were nine cases of diseases of the liver; twenty-two cases of primary heart affection (most cases included in these are of passive hyperemia of the kidney), fifteen cases of gastric and intestinal diseases, four cases of pernicious anemia, one case of leucemia, two cases of lead poisoning, four cases of emphysema, two cases of pulmonary tuberculosis, one case of fetid bronchitis, two cases of diabetes, one case of mediastinal tumor, one case of myxedema. Total: forty-one cases.

1. The relationship between azotemia, indicanemia, and indicanuria. The assertion of Rosenberg's that increased indican of the blood is produced by azotemia is not in accordance with my findings, because I have found increased blood indican in spite of a normal amount of residual nitrogen in the blood. This fact refutes Rosenberg's assertion that increased azotemia is responsible for increased blood indican.

2. Rosenberg's statement that increased blood indican is caused by resorption of indican, formed in excessive amounts within the intestinal tract, is also refuted because I found excessive amounts of indican in the urine and only little indican in the blood of the same person; on the other hand I found excessive blood indican and only little urinary indican in other cases.

3. Indicanemia, therefore, is not caused by increased azotemia in nephritics nor is it caused by increased formation of indican within the intestinal tract, but it is caused by retention. This retention in the blood takes place because the diseased kidney tissue meets the various nitrogenous products, des-

**Die Indicanemie ihre Bedentung als Nierenfunctionsprobe.* Urban & Schwarzenberg, Wien-Berlin, 1922.

tined for elimination, with various specific secretory difficulties; among these nitrogenous metabolites in the blood, indican happens to be the one the elimination of which the kidney rebels at first. It is possible (as E. Becher shows by his experiments on the distribution of indican in the various parts of the body, under normal and pathological conditions) that the indican which had been retained within the blood, on account of renal insufficiency, accumulates mostly in the blood, while only a little of it penetrates into the tissues, this in contradistinction to residual nitrogen and especially urea. This may account for the relatively large increase of blood indican compared with the increase of residual nitrogen and urea in the blood; it may also account for the retention of indican in the blood which takes place much earlier than that of the residual nitrogen and urea in the blood. This explains the cases where we find increased blood indican but still normal residual nitrogen of the blood.

4. In the various lesions of the stomach and intestines, we found blood indican values ranging 0.08-0.8 mg. per cent. We could not find any relation between these blood indican values and the urinary indican values; on the one hand we found increased blood indican in patients who exhibited only small urinary indican values while on the other hand we observed small blood indican values in spite of enormously increased urinary indican values. These observations do not conform with the statement of Georg Haas who reports as his highest blood indican value in the stomach and intestinal diseases 0.147; inasmuch as Haas precipitates the serum albumen with alcohol, while I, just as Rosenberg, used trichloracetic acid, I had to multiply the values found by Haas by 1.6—according to Vanbœmmel's suggestion—to conform my findings to those of Haas's, but even then, after such correction, I got higher blood indican values, in cases of peritoneal tuberculosis for instance. This fact corroborates rather Rosenberg's finding of blood indican values up to 0.2 mg. per cent., in cases of intestinal diseases, without renal affections. I do not believe that the increased blood indican values found in gastric and intestinal affections were due to the increased putrefaction within the intestinal tract because there are cases of large tumors and frequently bleeding ulcers among the cases with increased blood indican. Besides, as I have pointed out, there is no interrelation between blood indican and urinary indican.

5. Three cases of pernicious anemia (verified at postmortem) showed blood indican 0.16 and 0.80 mg. per cent. The residual nitrogen of these cases was always above the normal. As I have pointed out in my book on indicanuria (1912), the urinary indican in such cases is always increased; but that the blood indican in such cases is also increased, is a new fact which I wish herewith to state.

6. We do not find blood indican values above 0.24 m.g. per cent. in people with normal renal function (except in stomach and intestinal diseases and pernicious anemia), in spite of excessively high values of their urinary indican.

7. Four cases of emphysema exhibited normal blood indican values.

8. Three cases of lead poisoning without nephritis, exhibited normal blood indican values, though the urinary indican was excessively high in two cases.

9. Two cases of diabetes showed normal blood indican values.

10. Of nine cases of liver disease only two showed blood indican values above 0.16 mg. per cent. These findings are in contradiction to Rosenberg's statement that liver diseases frequently cause higher blood indican values.

11. Of two cases of acute nephritis, one showed blood indican above 0.16 mg. per cent. The indican values of the blood proved to be a much more reliable test for the renal function than the determination of the residual nitrogen in the blood.

12. In seven cases of chronic nephritis we found the blood indican always increased whenever the residual nitrogen in the blood was increased; but one can not say that the blood indican always diminishes whenever the residual nitrogen in the blood diminishes, because one frequently observes the blood indican increased in spite of a decrease of the residual nitrogen, one even finds blood indican values already increased while the residual nitrogen is still normal. On the other hand we never found normal blood indican with an increased residual nitrogen in the blood. In other words: The blood indican level increases more quickly and sooner than the residual nitrogen level, especially when the condition of the patient, clinically, becomes worse. All these findings conform with the findings of Georg Haas. The dilution and concentration test proved, in this group of cases, of equal diagnostic value to the quantitative test for blood indican; they were, however, just like the blood indican test, diagnostically superior to the residual nitrogen determination in the blood.

13. The seven cases of nephrosis all showed a normal blood indican level. The residual nitrogen test in this group was also normal.

14. The cases with hypertension were subdivided into, 1, those without albumin and without edema, five cases; 2, those without albumin and with edema, two cases; 3, those with albumin and without edema, six cases; and 4, those with albumin and with edema, one case. With due consideration of the clinical symptoms and the water test findings one can determine whether this hypertension is a, benign, or b, cerebral arteriosclerosis, or c, renal arteriosclerosis. The renal arteriosclerosis may be subdivided into a benign and malign nephrosclerosis. The blood indican values always denote the seriousness of the kidney lesion.

15. The relation of cardiac insufficiency and blood indican. The passive hyperemia of the kidney, produced by heart insufficiency, exhibits, at the beginning, normal residual nitrogen as well as indican values in the blood, regardless of whether the case presents edema and ascites or not. In the course of cardiac insufficiency, there takes place first an accumulation of residual nitrogen in the blood while the indican level still remains normal; in the further course, after a prolonged and repeatedly returning passive hyperemia has brought about a stasis nephritis, the indican level of the blood also increases. Later, when through therapeutic measures a profuse diuresis has taken place, the residual nitrogen in the blood may drop to normal, but the persistent increased blood indican will denote the permanent kidney lesion. If one finds, in a clogged kidney, norma

residual nitrogen, but increased blood indican, one must always suspect a kidney lesion. Thus the indican test on the blood becomes of great value for the differential diagnosis between cardiac and renal dropsy.

16. Through the kindness of Professor Eppinger, I had occasion to examine separately arterial and venous blood, received at the same time from the same patient. The residual nitrogen in the venous blood, in the four cases examined, always showed higher values than in the arterial blood; the indican value was higher in the venous than in the arterial blood, only in two cases (in the other two cases it showed no difference in value), perhaps due to the limitations of the colorimetric test. The higher values in the venous blood suggest the existence of metabolic indicanemia.

17. Of the ninety-eight cases observed, twenty died; the postmortem examinations corroborated the clinical observations made.

To enable the general practitioner to carry out the indican test on the blood, it is sufficient to use the following technic for the qualitative test because even the slightest purple discoloration of the chloroform in the qualitative test carried out with the indicated quantities of serum and test solutions is a positive indication of an amount higher than 0.16 mg. per 100 c.cm. serum, which means supernormal value of indican in the blood. The latter denotes always a permanent lesion of the kidney in all cases of hypertension.

INDICAN BLOOD TEST

Two test tubes.
Into tube I place 2 c.c. blood serum.
Into tube II place 1.5 c.c. serum.
Into tube I add 2 c.c. distilled water.
Into tube II add 1.5 c.c. distilled water.
Into tube I add 4 c.c. of twenty per cent. trichloracetic acid.
Into tube II add 3 c.c. of twenty per cent. trichloracetic acid.
Shake well and filter.
Add to each tube seven drops of five per cent. alcoholic thymol solution.
Shake well.
Add to tube I 8 c.c. of HCl solution.
Add to tube II 6 c.c. of HCl solution.
Shake well.
Let stand two hours and then add to each tube 2 c.c. of chloroform and shake thoroughly.
Slight purple discoloration of the chloroform is indicative of abnormal amount of indican in the blood.

SOLUTIONS NECESSARY FOR BLOOD INDICAN TEST

1. Hydrochloric acid 100 c.cm.
   Ferri chloride 0.5 grams
   Prepared fresh every week!
2. Thymol 5.0 grams
   Alcohol 100 c.cm.
3. Trichloracetic acid 20 c.cm.
   Distilled water 100 c.cm.

Periodic Physical Examinations for Physicians

OTTO H. LEBER, M.D.
New York

A close observer of articles pertaining to public health in the last few years must have been struck by a note sounded in them with increasing frequency, namely, that of periodic physical examinations for people supposedly in good health. With little notice taken of it at first, this idea has grown and taken greater hold year by year, until with its recent recognition by the American Medical Association a stamp of approval was placed upon it that must go a long way towards materially increasing the annual number of such examinations. No better proof of their practical advantage is needed, than the action of large life insurance companies in spending vast sums of money each year in gratuitously furnishing annual examinations, having satisfactorily proved to themselves that they are thereby lengthening their policy holders' lives and so putting money into their own pockets.

Left neglected for a long time, this field of endeavor for practising physicians has too long remained unused, and in the face of a falling mortality and morbidity rate automatically tending to lessen the physician's practice and his income, it should, and properly, initiate an increased activity in preventive medicine where amelioration and therapy have ceased to be necessary.

But we must practice what we preach, and my plea at this time is not so much enlarging this field in our practices, as pushing the adoption of this habit among ourselves, and propagating the idea among the medical profession at large. Since this idea has taken hold in my mind I have been observant and questioning among my fellow physicians, and find, as a general thing, such a shocking neglect of their own physical welfare as would call forth the greatest condemnation on our part were these individuals our patients; to say nothing of an apparent reluctance and neglect to avail themselves of those very medical services the value of which it is our daily business to advocate and impress upon the community at large. So far as periodic physical examinations are concerned, I have also yet to find a physician who while in supposed good health has ever submitted to one himself, if we except those compulsory and often incomplete and unsatisfactory examinations required by life insurance companies, the civil service, or those taken for admission to the military service. How to explain such a unanimous abstention of an admittedly beneficial practice I must admit I am at a loss to know. On the face of it, of course, a physician, better than anyone else, one would suppose, ought to be able, in a large number of cases at any rate, to note the early symptoms in himself of a very large number of diseases. But whether he is too close to get the proper perspective, too busy, or too careless, suffice it to say that far more notice would be taken of them if called to his attention by a fellow physician in the course of a painstaking examination. Again, there is something about high blood pressure, heart murmurs, albuminuria and a

host of other unpleasant physical signs, that a physician, quite willing to impart to others, is most loath to hear about when applied to himself. So important is this factor in my estimation, that the entire success of these examinations depends, in my opinion, no more upon the skill of the examining doctor as it does upon his common sense, his perception of the psychology of his patient and his ability to impart truth without having go with it a sense of haunting fear and worry that will accompany his victim from one examination to the next. I think that it can honestly be said, however, that this neglect is not due to any lack of confidence in his own wares, as it is to the peculiar psychology of the medical man's mind that proverbially makes him a bad patient. Admitting therefore as every physician does with whom I have conversed on the subject, that such periodic examination carefully carried out is of distinct value in prolonging a physician's life, and in promoting his efficiency, what measures are we to take to make this a movement sufficiently large in scope to really be of distinct value to a large proportion of our profession as well as a public health measure of considerable importance? The following it would seem would be some of the steps that ought logically to be taken:

1. The proposition should be broached and made the subject of discussion at all medical meetings.

2. The fullest publicity to the subject together with editorial comment in, 1, all medical journals that do not limit their pages to scientific papers exclusively; 2, similarly, and with quite as much importance, in whatever lay publications as would seem desirable.

3. The adoption of the idea by the leading men in the profession and officers of the various medical societies to the extent of setting an example and having such examinations performed.

4. The adoption of the principle even though it be among our own profession, of charging a fee for this service, and perhaps best, a definite and fixed one. Even though it is of course the recognized custom that physicians should not charge one another for services, it seems to me that when one considers this plan there occur to one a sufficient number of reasons why it might succeed better if it were universally understood that a regular fee were to be charged and accepted for such health examinations quite apart from the customary gratuitous services during an illness. Such a custom would without doubt result in a freer and wider choice of physicians, certainly most desirable, and a tendency to give and a right to demand greater thoroughness than might otherwise be expected between two friendly confrères. There is plenty of time to consider the amount this fee had best be, but ten dollars seemed to me as mutually reasonable as any, and could be considered quite a fair and proper annual charge for health insurance.

By working along these lines, I think, we can set in motion what might well be a popular movement of considerable proportions, which with the large amount of publicity, and the good examples set, might result in sufficient unanimity of action to go on with its own momentum and with the knowledge of its own good from year to year.

I say "might" advisedly, for there have been many causes and movements, which without a logical or proper argument against them, have failed for reasons of lack of urge, general lethargy or other reasons indefinable. And so I have wondered whether this cause could not be hastened by devising a formula if you will, to facilitate the early adoption of the plan by large numbers, rather than to wait upon the long drawn out effect of education alone.

This formula would be, first, the adoption in principle of this plan by the various county medical societies, to be followed by the inclusion in the annual dues of these societies of the fee for such examination for each member. I approach the suggestion of such a radical step as this advisedly and with full knowledge of the probable opposition such a proposal would be met with in these societies. But when I face the alternative, which I feel, like in so many other cases would be, quite universal approval, with at the end of each successive year quite as universal neglect as before, I then approach the subject with more boldness and less trepidation in the confidence that the medical profession will not hesitate to take a bold step when the ultimate goal fully warrants it. If adopted, the further method of procedure after this would have to be carefully worked out, but it should certainly call for free choice of examining physician, and might also call for direct payment of the examiner by the county medical society.

I do not wish to close this subject without making reference to what may be termed secondary effects of its success and which rival in importance the first proposition. This movement can hardly attain any large measure of popularity without almost of necessity including the various members of the physician's families and their households to the extent of their also adopting the practice and so directly increasing our welfare and happiness. We have here then a proportion of population which cannot be ignored in its size and in its power to preach and promote this healthy doctrine in the most far reaching way. Moreover what possible objection could there be after a universal adoption by ourselves for our organized state and county organizations and periodicals to push in a real and militant way by lecture, poster or advertisement in dignified yet forceful manner this doctrine and its power for public good among the population at large with a resulting increase in respect, importance and standing of the medical profession in the eyes of the public.

To sum up then, I am advocating a periodic, preferably annual, physical examination for physicians, to be advocated in a campaign of education in medical societies and in the medical and lay press for the promotion of the improved health, greater longevity and increased efficiency of ourselves.

The general adoption of this project by the rank and file of the medical profession should in addition go a long way toward making it plausible for us to stand before the public and advocate its universal acceptance and practice. The universal adoption of this practice by the public would be a forward step in public health education of the foremost magnitude and result in material benefit to the practice of medicine in general.

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The Romance of Medicine

Presidential Address

WILLIAM D. HAGGARD, M.D.

Nashville, Tenn.

"Taught by art divine the sage physician eludes the urn, and chains or exiles death."

The story of medicine enthralls the imagination by its infinite charm and arouses admiration for its victories in the battles against disease.

Its romance is so compelling that men cannot be unmoved by its blessings, when they realize with us its splendor. The records of the discoveries of medicine are more fascinating than fiction; their marvelous benefits are as if in response to Jeremiah's lament, "Is there no balm in Gilead, is there no physician there?"

The price of these great benefactions is beyond all the rubies of the world; it can never be computed and it can never be paid. In the Middle Ages the average life of man was twenty-odd years. Now the span has been increased almost threefold. Compute if you can the growth in economic value of a human life extended to this lengthened expectancy and worth an ever increasing yearly wage. Compute the value given by bestowing these benefits to all the nations of the world. If you can estimate these things, only then will you have totalled the economic wealth contributed to mankind by this incomparable service. And in the precious years that have been added to the span of life, countless days of unhappiness and suffering have been eliminated. Innumerable ills have been parried from the feeble flesh of man. What a glorious thing it is when the piteous procession of men and women beg of you to be allowed to live a little longer on any terms, that you can succor them by the knowledge of Nature's secrets that are your heritage from the studies of the scholars of all times.

W. D. HAGGARD, M.D.
President, American Medical Association, 1925-26

Wonderful as the past has been, the last fifty years of medicine have witnessed more achievements of a miraculous character than the five preceding centuries. This is the golden age of medical advancement. Discoveries of transcendent import have trooped on us in bewildering profusion. Allusion to some will suffice to give a glimpse of the glamour by which all are pervaded. The last century gave us ether and chloroform, by which, as Oliver Wendell Holmes said, "the fiercest extremity of suffering was steeped in the waters of oblivon and the deepest furrow in the knotted brow of agony has been smoothed away forever." Antisepsis has revolutionized surgery and made possible the present proud perfection of that most brilliant of all the arts. Mathematically, it has reduced the death rate from all amputations from 65 per cent. in Paris in 1861, to 4.5 per cent. in Pennsylvania today. Among its many almost incredible feats is now recorded a successful effort to cut the shortened cords inside the heart itself, and allow the fettered valves to close again securely. Although the heart is only one inch from the surface of the body, twenty centuries of surgery rolled by before the scalpel could travel that inch.

Medicine is the only profession that is literally and altruistically devoted to professional suicide. It endeavors chiefly, not alone to cure, but to prevent disease, and thus to banish from mankind pain, suffering and ultimate death from maladies of the flesh.

But what it cannot prevent it must cure. What it cannot cure it must palliate. Angina pectoris, the merciless, is now being attacked surgically and the heart pang relieved in certain cases by severing the sympathetic nerves in the neck that transmit the unendurable pain.

The discovery of the germ of tuberculosis, "the Captain of the men of Death," was the beginning of the annihilation of the Great White Plague and is a more important victory for mankind than resulted from the Fifteen Decisive Battles of the World. Already the death toll has been reduced from 160 per hundred thousand in 1910 to 97 per hundred thousand in 1922. But the fact that even today every third minute on the clock's dial marks a death from tuberculosis challenges us to still greater efforts. It is now largely a social problem. As the contagion for the most part comes from the lungs and mouth, we must teach everybody not only to burn expectorations, but to avoid this contagious material in every possible way. We must prevent, rather than be faced by the necessity of attempting later cure.

That the spirochete was the actual cause of syphilis, the great Black Plague, was discovered by Schaudinn in 1905. Miraculously enough, in the next year Ehrlich discovered that his six hundred and sixth experiment with arsenical compounds gave the present arsphenamin, with power to stay its ravages.

A romance in medicine to grip the admiration of the world is the subjugation of typhoid fever. In the Boer War, typhoid destroyed 8,000 British soldiers, while only 7,000 were killed by all the enginery of Mars. In the World War, as a result of antityphoid vaccine, which was given to each of our 4,000,000 American soldiers, and increasing knowledge of sanitation, only 1,083 cases of typhoid fever developed, with only 158 deaths. If the ratio between enlistments and deaths from typhoid in the American Civil War had been maintained in the World War, there would have been some 226,000 cases, with 62,694 deaths. This conquest of typhoid is one of the greatest benisons of modern medicine.

Under a picture that was current recently, of a fervent minister, robed and with upraised hand, was the legend "Preaching to beat Hell." We, as ministers of health, must also unceasingly preach—preach pure water, fresh air, sunshine, sanitary environment, plain, wholesome food, exercise and right living—to defeat the powers of darkness and bring the purity of heaven to earth.

Most dramatic among modern victories is the conquest of yellow fever, the scourge of the Spanish Main, "the pestilence that walketh in darkness; . . . the destruction that wasteth at noonday." An epidemic of this in 1793 took the lives of 10,000 people in Philadelphia in three months and kept the Southern states in consternation with the recurring seasons. Its devastation prevented the genius of France from building the Panama Canal across a zone which for four centuries had been called the "white man's grave." The indomitableness of Roosevelt was matched by the genius of Gorgas, the master of yellow fever, who made of the charnel hole of Panama the healthiest spot on earth. Thus occurred the union of the oceans through the canal.

In the opening year of the twentieth century, Reed, Carroll, Lazear and Agramonte proved, through the peacetime bravery of American soldiers who bared their bodies for the fateful experiments, that a mosquito transmits yellow fever. While experimenting with deathladen Stegomyia, one of these army surgeons was bitten on the hand and sacrificed his own life in the consuming passion to save his fellow man. No man hath greater love than this. As Agramonte said of him, "One more name, that of Jesse W. Lazear, was graven upon the portals of immortality." Is it immodest for us in recounting this heroic self-sacrifice to have the pride of guild and to regard proudly the noble deeds of our profession?

In the last decade, many diseases of the heart, kidneys, gallbladder and other organs have been shown to be derived frequently from the foci of infection around the teeth, in the tonsils, in the sinuses of the nose, and in other structures. This great discovery has enabled the physician to administer in many cases the most effective of all treatments, the removal of the cause. Rosenow has taken the infectious material from the vicinity of stone in the kidney and, by implanting it in a cavity drilled in the healthy tooth of a dog, has been able to produce stone in the dog's kidney in eighty-five per cent. of the cases. By injecting into the veins of a rabbit's ear material taken from an infected appendix, from ulcer of the stomach, and from inflammations associated with gallstones, Rosenow has also been able to reproduce the disease in the organ from which it was obtained. This experimentation seems to show the specificity of certain microorganisms for regularly attacking the same structures, under definite conditions. We know, for instance, that the agent in infantile paralysis gains access through the nasal cavity and lodges in the anterior horn of the spinal cord. Prevention or even eradication of diseased foci thrice arms the physician of today for the throttling of many insidious diseases or, if they have gained headway, their amelioration or cure.

The recovery of radium by Madam Curie close on the discovery of the röntgen ray by Röntgen in 1896 was not only a triumph in wresting another secret from the physical world, but has furnished a most necromantic weapon for the cure of certain forms of cancer and for its palliation in hopelessly neglected cases.

The use of safe drugs for local injection in rendering surgical operations painless is now like a performance in a world of magic. Antitetanic serum to prevent lockjaw is the king of preventive serums. Practically every battle casualty in France was potentially infected with lockjaw. Every wounded man that came back from the front had A. T. S. (antitetanic serum) pasted on his forehead. The universal use of the serum mercifully prevented the terrors of lockjaw.

The transfusion of blood into the veins of those who from injury or disease are sickened into the whiteness and coldness of death quickly brings back the glow to the check and the red lipped promise of reclaimed life. This boon was made possible by the discovery by Mall, of the four types of blood; the use of an untyped and dissimilar blood group donor is most dangerous.

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The extract is prepared from 50 per cent. short ragweed pollen and 50 per cent. of the pollen of the giant ragweed. The pollens have been collected by our own botanist and have fully matured on the plant before the harvesting. They have been freed from extraneous matter, dried over sulphuric acid and preserved in the dry state until the extract has been prepared.

The extracting process is accomplished with a menstruum of 67 per cent. C.P. glycerin and 33 per cent. saturated salt solution to assure the maximum stability of the resulting product.

Each dose has been accurately measured by units into a separate vial to be diluted at the time of injection. The extract will remain potent in this undiluted form for at least twelve months after leaving the laboratory.

Undoubtedly the cause of failure of hay-fever prophylaxis in the past has been largely due to the fact that aqueous, alcoholic and saline extracts have been used.

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Dose No. 2 contains 5 pollen units.	Dose No. 10 contains 240 pollen units.
Dose No. 3 contains 10 pollen units.	Dose No. 11 contains 350 pollen units.
Dose No. 4 contains 20 pollen units.	Dose No. 12 contains 500 pollen units.
Dose No. 5 contains 35 pollen units.	Dose No. 13 contains 700 pollen units.
Dose No. 6 contains 50 pollen units.	Dose No. 14 contains 1000 pollen units.
Dose No. 7 contains 70 pollen units.	Dose No. 15 contains 1000 pollen units.
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	Price	Code
Series I contains Doses 1 to 5 inclusive with the accompanying vials of diluent	$ 4.25	Admix
Series II contains Doses 6 to 10 inclusive with the accompanying vials of diluent	4.25	Atilt
Series III contains Doses 11 to 15 inclusive with the accompanying vials of diluent	4.25	Avens
Complete Treatment contains fifteen doses with the fifteen vials of diluent	12.00	Armor

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A Few Facts

The immunization treatment usually consists of fifteen graduated doses, and these may be given in as short a time as five weeks, allowing three doses for each week. Much better results have seemed to follow the less intensive schedule of dosage. It is suggested that fifteen weeks be allowed for the treatment and that the patient receive one dose each week. The series should be completed about a week before the time for the expected onset. Thus if a patient's hay-fever usually starts on August 15th, the treatment is ideally started on May 2nd or as soon thereafter as practicable.

"In those localities in which the ragweed is found, about 85 per cent. of all the cases of autumnal hay-fever are caused by ragweed pollen." From the book by Dr. Wm. Scheppegrell, President American Hay-Fever Prevention Association, "Hay-Fever and Asthma" (1922).

"Active immunization" (with pollen extracts) "offers hay-fever victims more chance for cure and relief than any other therapeutic measure." Dr. H. S. Bernton, *Journal American Medical Association*, May 5, 1923, page 1307.

Swan-Myers' Ragweed Pollen Extract is accepted by Council on Pharmacy and Chemistry, American Medical Association. See page 258 in "New and Non-official Remedies" for 1924.

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debtors to the innumerable instruments of precision, to the blood pressure apparatus, the basal metabolism rate machines, and the newer instruments for administering gases, that render anesthesia almost totally devoid of danger.

What is more astounding than the revelation in the last few decades of the part played in our bodies and lives by the wonder working ductless glands? They send weird and powerful hormones as chemical messengers to command the functions of the body. The thyroid gland presides over our growth; its absence makes the gnomelike grotesque idiot, the cretin. Administration of the lifegiving thyroid extract veritably restores the dead in mind and brings dwarfed bodies back to blooming youth. Compared to these realities, legends of old time restoration of the dead are but interesting myths.

It seems incredible that the pituitary gland at the base of the brain, weighing only two grams, will, when diseased, cause the prodigious growth of a giant, and when its secretion is deficient produce the enormous fat deposit of the pathologically obese.

The greatest romance of the last few years in medicine was the discovery of insulin by Banting. The wizardry of rescuing the diabetic patient by this remarkable discovery is truly a marvel.

Goitre is largely due to a deficiency of iodine in food and water. While it can be successfully removed, with an infinitesimal death rate, it should be prevented in childhood by the administration of iodine in small quantities to children twice a year. These wonderworking ductless glands largely determine personality. Individuality seems, after all, to be largely the product of the chemistry of our bodies.

Passing from the intangible to the practical, we may note that the solution of the pellagra problem seems nearer with the increasing belief that pellagra is a deficiency disease, possibly from a shortage of vitamines, and seems to be caused by faulty protein food mixture and is greatly benefited by fresh meat and milk. These and other contributions of medicine to the relief of humankind are more thrilling to the man of science than all the wars of selfish kings.

I am not an unqualifying eulogist of the profession of medicine; I am but telling the plain, unvarnished truths that constitute the romance of our great calling. Like every sublunary institution, that of medicine is subject to evils, many of them common to it and other professions, and many others pertain to it alone. We are prone to be overenthusiastic about each new advance; on the other hand, many of us are as unable to evaluate the worth of a fresh discovery as was Joseph Bell (the original of Sherlock Holmes) to recognize the solemn significance of antisepsis, as advocated by Lister, albeit he was his daily colleague in the wards of the Glasgow Infirmary.

It may not be regarded as romantic, and therefore within the realm of this paper, to recall that the cause of typhus fever is the bite of an infected body louse; but when one thinks of the terrifying epidemics on sea and land which have been stamped out by this knowledge and by sanitation, our medical accomplishment rises, not only to the romantic, but to the sublime. Likewise the most fatal of all infections, plague, bubonic and pneumonic, is transmitted to man by the flea that has bitten the infected rat. The extermination of the rat to prevent it and Haffkine's vaccine to cure it is a historic achievement. Rocky Mountain spotted fever has been shown by Ricketts to be transmitted by the wood tick.

The most threatening cloud of chronic disease in the South, hookworm, has been dissolved by the wand of Aesculapius. Through the labors of physicians and the beneficence of the Rockefeller Institute, the weakened, anemic, shiftless "poor white" has, by the use of thymol, been freed from the parasite. There is yet so much to discover. It requires a vision and endless, patient, animal experimentation. Claude Bernard said that whenever he left his laboratory he put on the cloak of his imagination in order to know where next to look, through experimentation, for Truth. The microbic causes of smallpox, of measles, of mumps, of chickenpox and of the much dreaded encephalitis (socalled sleeping sickness) are as yet undetected. And many chronic diseases are still eluding an accurate analysis and a cure. Lest we be vainglorious, let us hasten to remember that there is as yet no specific for pneumonia, which, with the other acute respiratory diseases, destroys more lives every day than any other one ailment.

Cancer, the most pitiless of all maladies, is our rebellious and still elusive foe. It has not yielded up its murderous secret. We know all about its life history except the very beginning. It is regularly curable in its first stages, in many cases by surgery, in many by radium, and in others by the roentgen ray; but its bacterial causes, if such there be, still elude the patient investigator. The honor and benefit of this great discovery is more to be desired by the physician than the wealth of Midas, the wisdom of Solomon or the glory of Napoleon.

The fiery serpent that bit the children of Israel when they wandered through the wilderness was possibly the guinea worm, which enters the body as a water flea, develops, and ultimately, lies coiled under the skin, from one to six feet in length. It formerly was coaxed out by winding it on a stick little by little each day. Then the zoologist found that it seeks water in which to lay its eggs, and will naïvely crawl out if the affected leg or arm is simply submerged in water for a few hours.

The mysterious is so simple when revealed by science! And so our learning advances little by little. Each of the myriad of discoveries for the protection of man against his environmental enemies is almost akin in comparative magnitude to the body of a single tiny coral insect in the great structure to which it contributes. Thus we rear the eternal structure of the Temple of Medicine.

PERIODIC HEALTH EXAMINATION

The real romance of present day medicine is to prevent or to discover early the degenerative conditions of the great organs, the heart, kidneys, liver and brain. All the saving in life has been in the prevention of infant mortality in the control of contagious diseases. Eternal vigilance of every individual by his physician is the price of lengthened life in the middle aged.

As civilization can be measured by the statistics of public health, so sanitation is an expression of humanitarian impulses coupled with intelligent and

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expert application of medical knowledge to the community. Preventive medicine has made phenomenal progress in recent years. Particularly is this exemplified in the unsurpassed efficiency of the American army from the point of view of health during the World War. It was the cleanest army the world has ever seen. There were required more than 35,000 of the flower of the American medical profession to make and keep it fit to fight. None but the regular practitioners of medicine were permitted to touch the bodies of the precious soldiers in cantonment or advanced sector; but the noncombatants were constantly attacked at home, as always, by bizarre methods of treatment, so called, of a type which, as Barnum said, the American people love.

Community health is much in advance of the prevention of illness in the individual. Physicians have been so busily occupied in the care of the acutely sick that they may have had little time and have given scant attention to those who are in apparent health. People in great numbers have been amazed, when resting securely in the supposed enjoyment of perfect health, to find that an examination for life insurance revealed some entirely unsuspected malady, such as Bright's disease, diabetes or heart disease, that could and should have been easily detected long before. One third of the people who die from heart disease or Bright's disease die before they are fifty years of age. Even apoplexy shows fifteen per cent. of its mortality under fifty. These three conditions cause more than one fourth of all deaths. By early detection and eradication of the causes of these fatal lesions, many unnecessary deaths can be prevented.

What does it profit a person to neglect his physical condition and the wonderful mechanism of his body, the temple of his immortal soul? All other machinery is thoroughly overhauled at regular intervals. Boilers are frequently inspected, lest they explode. We all, physicians and laymen, have ignored the tremendous importance of a periodic and thorough physical examination. We have thus neglected our patients and even ourselves. In Shakespeare's *Cymbeline,* the bard sagely remarks: "By medicine life may be prolonged, yet death will seize the doctor, too."

Have a thorough physical examination on your birthday! It should be a real survey of a man's physical as well as mental status. Why should not a yearly inventory be made by one's physician of his habits, environments, occupation and dietary? If this plan could become universal, it would be the best postgraduate course in physical diagnosis that our profession as a whole could take.

From the economic side, there could scarcely be a better and closer relation between the physician and his clientele. The actual care and completeness of the examination would be in such startling contrast to the inadequacy and makeshift examination by the irregular practitioners and cults that it would be an education to patients who are not now privileged to understand really the difference between a competent, regularly graduated high type physician and the man who without adequate preparation masquerades under the guise of a doctor. The humaneness of the thing would appeal to the patient who needs us to tell him how to keep well. We will utilize our skill in anticipating future disability. We shall be promoting the ever widening field of preclinical medicine, and shall at last come into our own, because in the interpretation of our findings and the laying down of rules of health and conduct we shall at last be carrying out the original meaning of the word "physician," which is teacher. We must learn to deal with the brutally healthy man who never thinks of anticipating disease and forgets what a tremendously intricate and wonderfully made machine he so woefully neglects. He is very confident, yet his apparently superb stamina sometimes plays him false by throwing him entirely off his guard and making him an easy prey for some insidious disease stealthily to take hold on him. The proverb says, "Honor a physician before thou hast need of him."

It is estimated that the number of cases of sickness in this country in a year is thirteen and a half million, costing the nation a billion dollars. It is astounding to think that there are 225 million days of sickness a year in the United States. If it were possible, by nation wide effort, to reduce the amount of sickness by twenty-five per cent., the total economic gain yearly would be around a quarter of a billion dollars. How can one estimate the worth in anguish relieved and death postponed? Prevention runs as a thread of gold through the fabric of medicine. Every time we prevent illness we not only preserve that one individual as a productive force, but also one or two persons who would be required otherwise to care for him. The military maxim that it is better to wound an enemy than to kill him is based on this idea.

The people should be taught that in truth there can no more be different "'schools" of medicine than there can be different schools of physics, or of mathematics or astronomy. There is nothing under the sun which is of proved value that has not and will not be used by the profession in the treatment of disease. All of chemistry, of sanitation, of serums, of massage, of treatment by radium, of surgery, and of application of drugs are at our beck and call. All are utilized in the treatment of diseases. Sane men will not follow a charlatan. But if any trustworthy guide, be he physician or layman, proves that a given remedy is of value in the treatment of diseases, we will utilize it and will honor him. We should not be compelled, however, as Zinsser remarks, to eat an entire artichoke in order to get a tiny bit of really edible substance. There are, regarding healing, many decidedly fractional truths. As to some of them, the term "half truth" is an unwarranted exaggeration. "Nay," said Lord Bacon, "we see the weakness and fragility of men in sickness, as they will often prefer a mountebank or witch before the learned physician, and therefore the poets were clear sighted in discerning this folly when they made Aesculapius and Circe brother and sister, both children of the Sun."

All nonmedical agencies are enthusiastic endorsers of health examinations. Life insurance companies quickly saw a great saving in the postponement of the termination of premium periods by early detection and correction in their beginnings of chronic and fatal maladies. And the persons insured also gain, for they have their lives conserved and their longevity prolonged. Social health agencies

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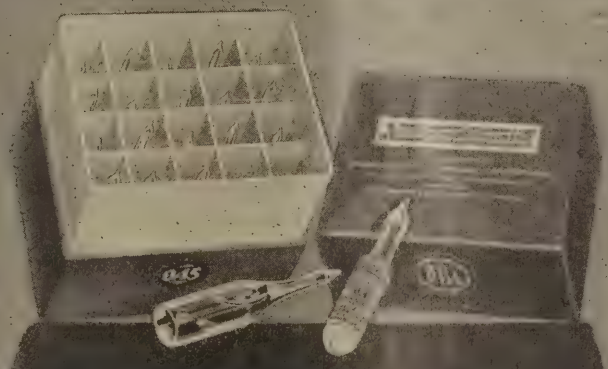

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promptly recognize a probable reduction in the cost to the public of care of the indigent sick, a wonderful increase in well being and freedom from painful and distressing illness, and a consequent great contribution to human happiness. Yet periodic health examinations are primarily a practising physician's direct obligation. Nothing is better calculated than they to bring about the continuity of the long established and mutually confidential relation of the medical profession with the community it serves. To be successful, however, the idea of health examinations would require a real campaign, with the laity cooperating.

Let us have a drive for the prevention of illness by making a survey of the apparently well and devising an inventory for right living and for properly planned hygiene for the needs of each individual case among our apparently robust patients—a drive to treat the incipiently sick while they can be cured.

We will treat the mind as well as the body. It will give the opportunity to ask that most important of all questions in the investigation of the chronic case; viz., "Are you happy? If not, why not?" Can any one give more sympathetic and sane advice about the abstruse mental and emotional problems of life than the resourceful, experienced, tactful physician? Is his not the buoyant, commanding personality by virtue of the peculiar oraclelike relation which he sustains to his patient to be the scientific and sympathetic Samaritan?

> Cans't thou not minister to a mind diseased,
> Pluck from the memory a rooted sorrow,
> Raze out the hidden troubles of the brain,
> And with some sweet oblivious antidote
> Cleanse the stuff'd bosom of that perilous stuff
> Which weighs upon the heart?

A health week should be established nationally by all the health agencies of this country, with the cooperation of every one of the 90,000 members of the American Medical Association. The press can be counted on to do its part, which is as essential as it is unfalteringly interested and helpful in all health movements. A manual for the examination is being prepared by the American Medical Association. Examination blanks can be obtained from the headquarters, making for completeness and uniformity. A copy of the examination might properly be given the patients for their information, and one kept by the physician as a permanent record. Last, but not least, is a well considered interpretation of the patient's needs, physical, occupational and mental; and comprehending advice may finally be given to meet his peculiar needs. While it is primarily a technically complete head to toe physical examination, it is more a stocktaking of the patient's physical condition and an annual audit for health guidance.

Kipling tells of a legend in which the gods stole the godhead from man, who was at that time a sort of deity. They agreed to hide it. The wisest of the gods, Brahm, hid this tiny, unstable light of the stolen godhead where man would never dream of looking for it—inside man himself. That has ever since been Brahm's secret and will always be until man himself discovers it. Can the physician not help him to find his lost godhead?

The stupendous advance in medical education in the last fifteen years reads like a romance. The United States contained 160 good and bad medical colleges, more than twice as many as the rest of the world. These schools have been reduced to eighty strong schools. The course has been doubled in the last three decades. More than one fourth of these schools are departments of state universities. Enormous endowments have made medical education the pampered favorite of private munificence. The medical schools of America can proudly take their place in the sun.

The supply of an adequate number of sane, resourceful, dependable physicians should have the solicitude of the profession as a whole, as well as of the medical educators. The fear has been expressed that we are overstraining our students, that the specialties are so fascinating and their teachers are so enthusiastic that too much time is devoted to them in the undergraduate years. These years should, in truth, be given to basic preparation. The student must in the four years in the medical school encompass all the broad, fundamental principles of medicine. The man who is going to become a specialist should wait until after his hospital internship and preferably some years in general practice before he takes up specialization. A specialty should be a postgraduate study, not a part of a student's first preparation.

The laboratory side also should not be overcultivated. Fundamentals should be stressed, but recondite experimental work omitted in the undergraduate course. Relatively few students are going to be purely research men, and comparatively few are temperamentally fitted for that service. It is impossible really to make of an undergraduate an expert in any of the laboratory sciences. An excess of laboratory instruction, to the deprivation of needed bedside work, will not best prepare the student for the treatment of the sick.

In this desirable correlation between the pure sciences and the clinical subjects, the student of anatomy and pathology should be brought in his first two years into contact with the patient, so that he will appreciate the relationship of his studies to the problems of disease. Much more interest would be evinced in chemistry and bacteriology if every student were early to be given a glimpse of his wonderful relation to the patient. Then later, when the purely clinical work is taken up, it is not wise to abandon the study of biochemistry and physiology. Regarding clinical work in England, the Council on Medical Curriculum has advocated the continuation in the clinic itself of anatomy, physiology, pathology and chemistry, as these apply to the problems of medicine and surgery there presented. In this country our clinical and pathologic conferences have the source of the greatest inspiration.

The new medical school of Vanderbilt University is entirely housed in the hospital, thus linking up the wards with the laboratories in an integral and intimate way. We feel that it will be a distinct gain. It will afford an unparalleled opportunity for the simultaneous study of the medical sciences and the patient. The pathological department will be a guiding centre. Fresh tissue and not merely postmortem of terminal processes will be studied. It will concentrate on the causes as well as the development of disease. With the close relation of the dispensary

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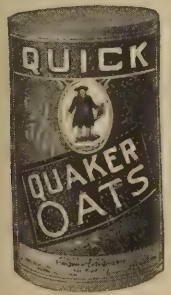

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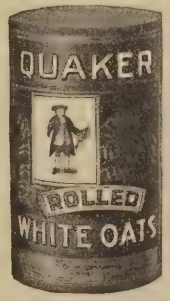

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and the hospital, the pathological department, where all the problems of the patient can be brought and where all the men can work as undergraduates, as interns, as residents and as members of the staff, it ought to foster a spirit of investigative interest in the patient that will be stimulating to the completest possible training.

Our British cousins speak of the American methods as encyclopedic theory, and say that our effort in diagnosis is to make such a thorough study of the patient's state that no cell remains unturned. The student must be taught, as urged by President Hadley, to distinguish between the possession of information and the power or habit of thought. There is no substitute for thinking. Knowledge is proud that he has learned so much; Wisdom is humble that he knows no more.

A physician who gets a good start on a limited original training may go further than his more erudite brother, but he will always be happier and more efficient if he is interested in the humanities. The student must not be allowed to get so interested in the disease that he forgets the patient.

The question of entering the student into practice at an earlier age is important. It is impossible to devote to preliminary preparation less than two years of college work in biology, physics and chemistry, and it is impossible to eliminate anything from the four year medical course. The hospital year is essential. The only chance to curtail the length of time would be by saving one or two years in the high school. This can be done by the four quarter school year and no compulsory vacation at an unchangeable time, thus saving one or two years for the student with medicine as his goal.

SPECIALISM

One of the greatest romances in the art of medicine has been the amazing growth and perfection of the specialties. A man with an adequate training and a wide knowledge of disease, who devotes his entire time and thought to the problems of one department of medicine or one group of organs, can arrive at a surpassing degree of excellence. Some of the most intricate processes of relief for disease and injury are practiced by the specialists with an almost uncanny degree of dexterity. The removal of foreign bodies from the lungs by the bronchoscopic method amounts to legerdemain. The skill that is amassed by employing methods of precision over and over again becomes truly miraculous. The accumulative experience begets wisdom and judgment and a choice of the methods that are the most effectual. The development of the specialties has been possible by the focusing of original and brilliant minds on problems that are beckoning for solution. Specialism is so alluring that it is impoverishing the personnel available for the laboratories and decimating the ranks of the general practitioner. It is astounding what the country doctor, unaided by the panoply of present day instruments of precision, accomplished by the use of his five senses and that other very essential sense—common sense. "All but eternal doom was conquered by their art."

One of the drawbacks of specialization is that it loses for the physician the personal touch and close contact with the family and with the acutely ill. The family physician has with the family during illness a personal, intimate, sacred relation which the specialist can never enjoy. The general practitioner must retake his former position of importance. The grander domain of internal medicine must remain steadfastly the soul of medicine, the centre of the color standard.

THE FAMILY PHYSICIAN

The family physician has ever been the bulwark of medicine. "He shall heal the nations and defraud the tomb." His has been the labor of love as well as a superb endeavor to combat disease and rout it from its citadel. He is confronted with the most desperate conditions and has with rare resourcefulness risen to his responsibilities. The intrepidity of the country doctor in the management of the emergencies of accident and disease, the perils of childbirth, and the mastery of conditions under the most adverse circumstances is unparalleled. His calling exacts, as Kipling said, the utmost that men can give—full knowledge, a steadfast hand, exquisite judgment and skill of the highest, to be put forth not at any self chosen moment but daily at the need of others. He knows how to gild the gloom of affliction's couch with the silver lining of Hope.

The pagans believed that the physician came from the god of music, since it was his province to keep in tune the harp of a thousand strings. The physician has been eyes to the blind, feet to the maimed, deliverer of the poor; he has caused the widow's heart to sing for joy, and has gained the blessings of him that was ready to perish. He has been the Good Samaritan, and has imitated the benevolent miracles of the Great Physician.

Who will write the epic of the family doctor? Would that a Shakespeare could weave his deeds of bravery, his tender sympathy, his discretion and tact, his cheerfulness and courage, his devotion and fortitude, into an immortal sonnet.

Oliver Wendell Holmes apostrophized the spirit of service:

> Charity is the eminent virtue of the medical profession. Show me the garret or the cellar which its messengers do not penetrate; tell me of the pestilence which its heroes have not braved in their errands of mercy; name to me the . . . practitioner who is not ready to be the servant of servants in the case of humanity, . . . and whose footprints you will find in the path to every haunt of stricken humanity.

Yours is a glorious privilege of "inscribing your memories not on perishable marble but in the living affections of your fellow men." The war trump, the muffled drum, the measured tread of armed men, and the musket shot pealing over the grave honor the death of the soldier, but the physician who meets his death battling for Truth in the great arena of Science passes often to an inconspicuous grave, mourned only by the few who knew his worth.

At the southern entrance of St. Paul's Cathedral stands a statue of Sir Astley Cooper, by Bailey, a beautiful commemoration of the unrivaled surgical reputation of this great surgeon and of his fame as a teacher. Who will erect a monument in bronze or stone to the family physician? Would it not be fitting to perpetuate symbolically the vision of his service and the splendid part that he has played in the pioneer civilization of this country? We have commemorated our statesmen, scholars and warriors.

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What of the man whose life is spent in the interest of humanity, for preserving their lives instead of the ruthless destruction of their bodies? An unknown British warrior lies in the crypt of Westminster Abbey to commemorate the spirit, the bravery and the sacrifice of his fellows. Above him is inscribed:

They buried him among the Kings because he had done good toward God and toward His house.

The French have immortalized their unknown soldier under the Arc de Triomphe, typifying the unparalleled fervor, fearlessness and patriotism of the poilu; and we in America have enshrined our unknown soldier at Arlington. It is time that a monument be erected to the unknown family physicians—generations of them—in grateful acclaim of their unfaltering love of duty and ineffable devotion to suffering humanity.

The Scientific Proceedings

We present below abstracts of some of the more important papers read at the various section meetings.

SECTION ON PRACTICE OF MEDICINE

CHAIRMAN, DR. ELLIOTT P. JOSLIN, OF BOSTON.
SECRETARY, DR. E. S. KILGORE, OF SAN FRANCISCO.

Chronic Nephritis.—Dr. Henry A. Christian, of Boston, said that classifications of nephritis usually were very complex. Their complexity decreased their practical service in the clinic. Almost all had an anatomical basis and very often autopsy failed to show the anticipated anatomical lesion. Complicated classifications created a false idea of our knowledge of nephritis. A simple clinical grouping of patients with nephritis was suggested. Patients with chronic nephritis were subdivided into, 1, chronic nephritis with edema; 2, chronic nephritis without edema; 3, vascular hypertension progressing into nephritis. In group 1 hypertension was rare until the late stages, while in group 2 it was present throughout with very few exceptions, and in group 3 it was the first change noted.

Chronic nephritis with edema, the author said, meaning edema of renal origin, was actually a rare condition. Very few patients with chronic nephritis without edema gave any history suggestive of an onset with acute nephritis. Patients who had had acute nephritis were not more liable to chronic nephritis without edema than were normal persons who had never had acute nephritis. Patients with chronic nephritis without edema were actually patients with general vascular disease in whom the renal disease was but a local manifestation. This type of cases made up a very large percentage of those diagnosed as chronic nephritis (almost 1,600 out of 1,650 cases of nephritis).

There were many evidences of diffusely spread vascular disease, such as high blood pressure, changes in the eyegrounds, palpable peripheral vessels, evidence of calcification as shown by x ray, angina pectoris, cardiac decompensation, cerebral disturbance, nose bleeds, etc. In studying the vascular lesions the ophthalmoscope and the x ray had been of great service. Only relatively simple, bedside methods were needed for a satisfactory study of patients with chronic nephritis.

Hypodermic Digitalis Preparations.—Dr. Harold E. B. Pardee, of New York, presented a clinical study, with a lantern demonstration. He said that an attempt had been made to determine the potency of various commercial digitalis preparations recommended for intravenous injection. The method used was to find the smallest dose that would produce an effect upon the T wave of the electrocardiogram. This method had previously been tried by the author with different samples of tincture of digitalis, and been found a satisfactory way to measure their potency.

Digifolin, digitan solution, digalen and the Burroughs Wellcome tablets of amorphous digitalin had been tested and their potency found to be far less than that suggested by the manufacturers. The initial doses of these drugs must be from five to ten times that recommended, in order to produce powerful emergency digitalis effects.

With the minimal effective doses of these drugs, it was found that the T wave change does not appear until from six to twelve hours after intravenous administration. This is later than it appeared after large doses of tincture of digitalis by mouth. Evidently the absorption of a large amount of the drug from the intestinal tract affected the T wave more strongly than did the injection of the minimal effective dose directly into the blood stream. The application of these things to the dose of the intravenous preparations was discussed.

Is Arteriosclerosis a Hereditary Constitutional Disease?—Dr. M. A. Mortensen, of Battle Creek, Mich., called attention to the fact that arteriosclerosis was not a modern disease. Egyptian mummies had been found with sclerotic vessels. Mortality statistics of the last few decades had shown a gradual increase in arteriosclerosis and associated diseases, which made the subject of cardiovascular renal disease a vital one to the practitioner as well as to his patients. While the etiology of arteriosclerosis was widely discussed in medical literature, most authorities agreed that knowledge of it was still limited and uncertain and hence the author put the subject of his study in the form of a question. Infections, acute and chronic, excessive indulgence in protein food, tobacco, alcohol, coffee and even overwork, he said, had been advanced as causes of arteriosclerosis, but these factors, even to an extreme degree were by no means always productive of the disease nor did extreme abstinence save one from this condition. Because of this fact, he had for many years looked upon a cardiovascular renal disease as belonging to a certain type of persons having a predisposing tendency to degeneration of arterial tissues. Osler recognized the hereditary factor when he referred to the inheritance of poor arterial tubing unable to stand the wear and tear of the circulation. For this reason, he said, he presented observations on a large series of cases studied from the points of view of heredity and blood chemistry. The study included three hun-

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dred cases of arteriosclerosis, two hundred healthy women, two hundred cases chosen because of blood uric acid being below 3.0 mgs., and two hundred with blood uric acid above 4.0 mgs.

His conclusions were as follows:

He believed that arteriosclerosis or cardiovascular renal disease was definitely hereditary, a fact which had been amply proved by careful study of family histories. Also by way of heredity an abnormal protein metabolism was transmitted, which was manifested by an increased uric acid content in the blood, and no doubt occurred long before any evidence of hypertension or renal disease could be detected. This increased uric acid in the blood suggested an inherited inability properly to metabolize protein, which might be endocrine in origin, or due to abnormal function of liver cells. Our best and most rational prophylactic measure as well as remedy was a basic diet, which necessitated a reasonably low protein intake.

Treatment of Bronchial Asthma.—Dr. Albert H. Rowe, of Oakland, Cal., gave a lantern demonstration of protein sensitization skin tests in the treatment of bronchial asthma and presented the following conclusions:

One or more protein sensitization skin tests were found positive in ninety-one per cent. of 234 cases of asthma. Treatment of asthma based on such reactions usually gave satisfactory results if full cooperation of the patient was obtained. Sensitization was usually multiple. Inhalants, including animal emanation substances, orris root, and pollens were the most frequent causes of asthma. Wheat, eggs, milk, and other cereals were in order of sequence the most common foods to cause asthma, though any food may be responsible. Asthma due to bacterial allergy alone was rare in our experience. Vaccine therapy was of value in bronchitis secondary to asthma caused by other protein sensitization. Operations on the nose and throat rarely cured asthma and should only be done after a thorough protein sensitization study. A change of climate to control asthma was unnecessary and not economical. Complete or marked relief had been obtained in approximately ninety per cent. of 234 cases of asthma.

Splenectomy in Banti's Disease.—Dr. Nathan Rosenthal, of New York, said that the fibroadenia of the spleen in Banti's disease appeared to be a hyperplasia of the reticuloendothelial system, the overactivity of which might be primary or secondary. The primary type was associated with a bleeding tendency, he said, owing to a diminution of the blood platelets. Purpura hemorrhagica might also occur. The secondary type was the result of thrombocythemia. Here the blood platelets remained permanently increased in number after splenectomy. Thrombosis of the veins occurred at frequent intervals. The results from splenectomy in the first type were better.

Nonsyphilitic Aortitis.—Dr. Lester Neuman, of Washington, D. C., called attention to the fact that this was not an uncommon disease, and was commonly overlooked. He said it was found at all ages, especially from twenty-five to forty-five years. The symptoms were usually dyspnea and precordial pressure, and pain after exertion. There was usually a systolic murmur, along the course of the thoracic aorta, visible supersternal pulsation, and sometimes a widening of the aorta which could be demonstrated. The probable etiological factors were infection and overexertion. Treatment consisted of the removal of all foci of infection, prolonged rest, and the administration of iodides.

Growth, Development, and Prognosis of Diabetic Children.—Dr. Elliott P. Joslin, of Boston, in his address as chairman of the section, presented a summary of the records of diabetic children treated with insulin over considerable periods of time, with special reference to their growth, their basal metabolism, and sexual development. He spoke of the probable prognosis, and made many valuable suggestions regarding the proper treatment of these children.

Incipient Hypothyroidism.—Dr. William H. Higgins, of Richmond, Va., in a clinical study of hypothyroidism, presented an analysis of a series of cases with only moderate reduction in basal metabolism and minor signs. These he contrasted with true myxedema and pointed out certain similarities to hyperthyroidism.

SECTION ON OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY

CHAIRMAN, DR. RUDOLPH W. HOLMES, OF CHICAGO.
SECRETARY, DR. CARL HENRY DAVIS, OF MILWAUKEE.

Tuberculosis of the Vagina.—Dr. Lawrence R. Wharton, of Baltimore, presented an interesting paper on this subject, with a lantern demonstration. He concluded that tuberculosis of the vagina was one of the rarest of all gynecological diseases; that it almost never occurred as the primary manifestation of the disease; at necropsy, in practically every instance, older tuberculous lesions had been found elsewhere. The vaginal lesion was not always secondary to tuberculosis of the uterus or Fallopian tubes; in fourteen of twenty-eight cases examined at necropsy, the uterus, tubes, and ovaries were normal. The treatment and prognosis depended upon the activity and extent of the associated tuberculous lesions. Tuberculous ulcers of the vagina rarely yielded to conservative treatment; excision was the procedure of choice. In every instance, however, the therapeutic problem was fundamentally medical and the patient should be treated from that viewpoint.

The author also presented a case from his own experience, and appended a reliable bibliography of the recent and most valuable articles on the subject.

Distribution of the Ovarian Follicular Hormone in Human Genital Tissues.—Dr. Edgar Allen, of Columbia, Mo., and Dr. J. P. Pratt, of Detroit, said the presence of an active substance in ovarian follicles was demonstrated by the substitution of extracts for certain phases of ovarian endocrine activity in the rat and mouse. Using this decisive physiological test and the "rat unit" as a standard, quantitative analyses had been made of ovarian tissues and tissues of pregnancy from several domestic animals and man. Human tissues tested included normal and cystic follicular contents and corpora lutea removed at operation at different periods of the menstrual cycle, three corpora excised during early

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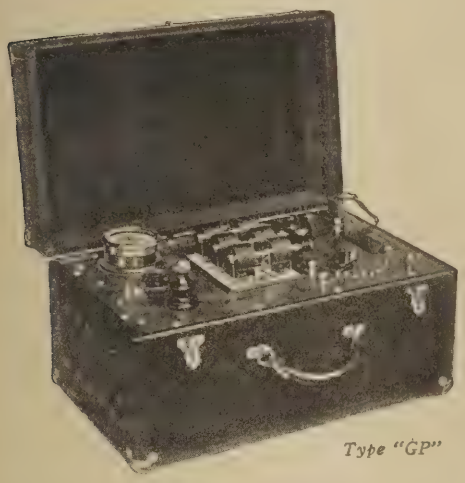

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pregnancy, placentas at three and seven months and full term, and two intact embryonic vesicles. The authors reported that the human corpus luteum, unlike that of the pig and cow, continued the secretion of the follicular hormone in appreciable amounts for a considerable period following ovulation. Positive results from extracts of tissues of pregnancy might possibly indicate that the developing human embryo also continued the elaboration of this secretion.

Abdominal Surgery in Diabetic Patients.—Dr. Daniel Fiske Jones, of Boston, said that the diabetic patient with abdominal disease should be treated as a normal person, except in rare cases. This conclusion he said was reached partly because of the use of insulins, but more particularly because of the increased knowledge and experience of medical men in handling these cases. Team work between the medical man and the surgeon was necessary to obtain the best results. Abdominal emergencies were much more serious in a diabetic than in a normal person. Delay in these cases to give insulin was an unnecessary and dangerous procedure. The diabetic patient did not react to infection or to pain to as great an extent as a normal person; consequently delay was frequently advised, at great risk to the patient. To get a patient with a septic process in the abdomen sugar free was almost impossible. The author emphasized the importance of the use of insulin and a proper diet after operation in these cases.

Dilatation of the Ureter and Kidney Pelvis During Pregnancy.—Dr. Herman L. Kretschmer and Dr. N. Sproat Heaney, of Chicago, said that the cases they had studied divided themselves into two groups—normal cases without symptoms and cases with infection (pyelitis of pregnancy). They said that in normal cases, dilatation was found in nearly all cases examined. They discussed unilateral and bilateral dilatation, and the varying degrees of dilatation found, also variations in the course of the ureter. They stated that when infection existed, dilatation was found in every case. They noted that after delivery there was a rapid disappearance of dilatation. No constant pathological obstetrical factors were discovered.

Reducing the Surgical Risk in Some Gastrointestinal Conditions.—Dr. Thomas G. Orr and Dr. Russell L. Haden, of Kansas City, Kansas, said that several observers had noted an increase in alkalinity of the blood in pyloric obstruction; others had found an increase in the nonprotein elements of the blood. Acute pyloric and upper intestinal obstruction produced definite changes in the blood chemistry manifested by a fall in the chlorides, a rise in the carbon dioxide combining power of the plasma, and a rise in the urea and nonprotein nitrogen. The chlorides seemed to have some protective value in inhibiting or preventing the toxemia. Animals could be kept alive as long as thirty days with upper intestinal obstruction when treated daily with one or two per cent. sodium chloride. The same quantity of distilled water did not protect.

The authors stated that all acute intestinal obstructions should be treated with sodium chloride both before and after operation to reduce the toxemia. Sodium chloride might be administered either subcutaneously or intravenously.

Poor Surgical Risks.—Dr. William Thalhimer of Milwaukee, in a symposium on this subject, spoke of the laboratory aids used in preparing patients for operation and in caring for them postoperatively. He said that a patient was a poor surgical risk usually because of cardiac disease, renal disease, anemia, vomiting or diarrhea. Modern methods of examination easily determined the degree of cardiac and renal disease. The first was comparatively easy to diagnose and control. Renal disease was more difficult to evaluate, and even more difficult to treat after operation. Moderate or mild anemias were not given enough attention, even today, and transfusion should be used more often. Vomiting might be accompanied by either acidosis or alkalosis. With laboratory help each of these conditions was easily recognized, but they might be confused clinically. To treat the case properly, the exact condition must be diagnosed, as what relieved in one case, intensified in another. A lantern slide demonstration was given.

Distribution of Ovarian Follicular Hormone in Human Genital Tissues.—Dr. Edgar Allen, of Columbia, Mo., and Dr. J. P. Pratt, of Detroit, Mich., stated that the presence of an active substance in ovarian follicles was demonstrated by the substitution of extracts for certain phases of ovarian endocrine activity in the rat and mouse. In a former study conducted by Dr. Allen in collaboration with Dr. Edward A. Doisy (*J. A. M. A.*, lxxxi, 819) he found that the subcutaneous injection of liquor folliculi and extracts of follicular contents from ovaries of swine induced typical oestrus in spayed mice and rats. That definite degree of hyperplasia in the genital tract was found to be equal to the maximum attained in the normal animal under the influence of the ovaries. Three or four one c. c. injections of an active extract at intervals of four to eight hours returned positive results which were apparent forty-eight hours after the first injection. The application of a practicable test which could be followed in the living animal together with the short cycle of test animals had made these results definite and clear cut.

Using this decisive physiological test and the "rat unit" as a standard, quantitative analyses were made of ovarian tissues and tissues of pregnancy from several domestic animals and man. As far as the authors were able to ascertain, these were the first tests of this nature made upon the internal secretion of the normal human ovary.

Human tissues tested included the contents of normal and cystic follicles and whole corpora lutea removed at operation at different periods of the menstrual cycle, three corpora excised during early pregnancy, placentæ at three and seven months and full term, and several early embryonic vesicles.

Normal follicular fluid from human ovaries contained this active substance in concentration equal to or greater than that of pig ovaries. The human corpus luteum, unlike that of the pig and cow, continued the secretion of the follicular hormone in appreciable amounts for a considerable period following ovulation. Positive results were also obtained from extracts of certain of the tissues of pregnancy in man. Whether this meant an actual secretion by these tissues or a collection in them of hormone elaborated in the ovary was still an open question.

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SECTION ON UROLOGY

CHAIRMAN, DR. ROBERT V. DAY, LOS ANGELES, CAL.
SECRETARY, DR. GEORGE GILBERT SMITH, OF BOSTON.

Chairman's Address.—Dr. Robert V. Day, in his address as chairman, discussed the urological problems which the general practitioner, the internist and the surgeon encountered in their daily practice.

Value of Blood Transfusion in Surgery of the Prostate.—Dr. A. I. Dodson, of Richmond, Va., stated that blood transfusion was of special merit in the treatment of prostatic hypertrophy. These patients had reached the age when recuperation from injury was slow and many were additionally handicapped by anemia and sepsis. By increasing the volume and quality of the blood, thereby improving the general vitality and quickening the action of the bloodforming centres, blood transfusion was a most valuable adjunct to the preoperative care.

In a series of 147 deaths from prostatectomy collected by J. B. Deaver, Dr. Dodson said that hemorrhage and shock occupied second and third places as causative agents. It was in this class of patients that blood transfusion was of greatest help. The bloodvessels of many of these old men, because of sclerotic changes, were unable to adjust themselves to the rapid loss of fluid from the vascular system. There resulted a fall in blood pressure which frequently went on to compete collapse and death, unless the fluid volume was restored and maintained. The benefits of saline infusions were often too transient to be dependable. Five per cent. glucose solution was of more service, but lacked the advantage of restoring the blood cellular loss, and had the disadvantage of causing occasional reactions.

A method of transfusion should be used that would give the fewest possible reactions. The direct method, using the Bernheim cannula, was most satisfactory, being practically free from danger and delivering the blood to the patient in its natural state. In the series reported whenever the blood transfusion was used in uncomplicated shock or hemorrhage the blood pressure was restored and recovery resulted.

In the seven cases reported, all patients below the average as operative risks. Four had carcinoma of the prostate and all of them some degree of arteriosclerosis. In two cases, transfusion was given because of hemorrhage, in two because of shock, and in three because of gradual failure of the circulation and inability to rebound. The four patients transfused for hemorrhage and shock were immediately relieved of their distressing symptoms and made uneventful recoveries. Of the three other patients, one recovered and two died. The one who recovered showed no distressing symptoms, except a gradual lowering of blood pressure and feeling of weakness. He was transfused thirty-six hours after operation, when his blood pressure had fallen to 88/58. He showed immediate improvement and made an uneventful recovery. The two patients who died were both operated upon for carcinoma of the prostate. One of these patients did well for twelve hours when his pulse rate began to increase and his blood pressure gradually to fall. There was also a rise in temperature and he was greatly distressed by persistent hiccough, vomiting, and distention. He was transfused twenty-four hours after operation with apparent temporary benefit, but died thirty-six hours later. The other showed considerable degree of shock three hours after operation, which was relieved by the intravenous administration of five per cent. glucose solution. Marked distention developed and the patient vomited and hiccoughed continuously. Five days after operation he was again given five per cent. glucose intravenously because of his inability to take fluids by other means. This was discontinued because of a chill after 200 c.c. had been given. A direct transfusion of eight minutes was then given with the hope of boosting him up, but there was no improvement and he died twelve hours later. The author summed up by saying that he believed transfusion was of great benefit as a general tonic to the anemic, debilitated, old man during his preparation for prostatectomy, and in the treatment of shock, hemorrhage, and the general asthenic state following prostatectomy.

Autonephrectomy.—Dr. Lionel P. Player, of San Francisco, Calif., presented a review of the literature of autonephrectomy with a report of experimental studies on rabbits and dogs in an endeavor to produce lesions similar to those encountered in humans by the blood, lymph and direct ascending routes, employing cultures of tubercle bacilli and pyogenic bacteria. He demonstrated a new method of diagnosis and reported an unusual case with patent ureter and pelvis with medullary and central portion entirely separated and walled off.

Urological and Clinical Diagnosis.—Dr. P. A. Rohrer, of Seattle, Wash., presented a statistical report of three hundred cystoscopic examinations. The important facts brought out were:

1. A negative uranalysis and a negative plain x ray plate did not insure negative kidneys.
2. The importance of urological study in helping to explain obscure abdominal symptoms.
3. The importance of urological examination as an aid to differential diagnosis in patients complaining of rightsided abdominal pain..
4. Mention was made of the number of genitourinary diagnoses confirmed by operation; also the abdominal diagnoses confirmed by operation.

Carcinoma of the Bladder.—Dr. J. Dellinger Barney, of Boston, reported an unusual case of carcinoma of the bladder. Hematuria occurred in a woman about fifty years of age, following hysterectomy for suspected carcinoma of the uterus, but in which no evidence of carcinoma could be found. Hematuria probably existed before hysterectomy was done. Several examinations of the bladder showed nothing whatever to cause blood and both kidneys were found to be negative. Finally, under the air bubble at the top of the bladder, a fine, hairlike stream of blood was seen to be pouring out, but no evidence of neoplasm could be seen. The bleeding was intermittent. After some months a tiny elevation the size of a blackheaded pin was seen at the point of hematuria. Believing that this was a papilloma, it was fulgurated on two occasions, with the high frequency current. After this no hematuria occurred for some time. Subsequently hematuria reappeared and the growth was seen as before and about the same size. Believing that an exploration should be made, operation was performed and re-

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vealed a hard, scirrhous type of carcinoma, involving the dome of the bladder on its peritoneal surface and extending laterally well down onto either side, especially the right. A transperitoneal resection of the bladder was done, removing all but a small cup containing the ureters and urethral orifice. Peritoneum was closed with drainage and the remaining portion of bladder sutured together around a rubber tube. Convalescence was stormy, but eventually the patient left the hospital in good condition. She has been seen since, several times; bladder function is entirely normal and there is no evidence thus far of recurrence. The report of the pathologist showed the typical appearances of carcinoma.

Fifty Years of Progress in the Treatment of Gonorrhea.—Dr. Victor G. Vecki, of San Francisco, Calif., presented an interesting summary of the advancement which had been made in the treatment of gonorrhea during the past fifty years. The following points were emphasized:

Until about fifty years ago practically only internal treatment was used; Sigmund's syringe was one of the first attempts at local treatment; the discovery of the offending germs; the centres of genitourinary activities; the use of suppositories; irrigations; the massaging of the prostate; instillations; vaccines; fuchsin and other dyes; local use of heat; intravenous medication; the pendulum swinging again the other way, towards internal medication.

Lowered Fertility in the Male.—Dr. Donald Macomber, of Boston, Mass., said that his paper did not deal with absolute sterility but with the recognition and treatment of conditions which reduced fertility in the human male. Fertility was a variable quantity and might be affected by diet, climate, muscular tone, nervous energy, as well as by mild congestions or infections in the genital tract. Once fertile, always fertile, is a patent misstatement of fact. The methods of history taking and examination which aid in the recognition of these functional disorders were detailed—particularly those dealing with sex habits and the special examinations of the semen. The abstracts of several typical case histories were given to illustrate the various aspects of diagnosis and treatment.

A Device for Controlling Hemorrhage After Prostatectomy.—Dr. Edgar G. Ballenger and Dr. Omar F. Elder, of Atlanta, Ga., presented a lantern slide demonstration of a device for controlling hemorrhage after prostatectomy which differed from the usual hemostatic bags in that it could be introduced through the urethra like an ordinary catheter. This, they said, was of particular advantage when unexpected postoperative hemorrhage occurred.

The bag is introduced into the bladder through the urethra and is then distended with fifty to sixty c. c. of blue sterile salt solution. Traction is applied either by an attendant or by light weights (one or two pounds) as required. Being distended with a blue solution enables the nurse to recognize at once any leakage from the bag in case it is damaged during or after its introduction.

The small size and great strength of these bags are made possible by the use of the socalled fish skin condoms. This material is soft, thin and strong and is well adapted for such a purpose. There is one disadvantage, however, and that is that there are small holes in it, so it is necessary to use thin rubber under it, such as a finger cot or a Kollmann dilator cover to prevent the fluid from leaking.

Cylindrical sections of these two materials are smoothly tied around the end of a catheter and then a Kollmann dilator cover is passed over the bag to hold it smooth and even. When collapsed they are about 26 French. Small needle holes are made in the fish skin material to allow the escape of the fluid in case the inner rubber bag should break. Care must be taken in making these bags to see that the lumen of the catheter is not obliterated by undue tightness of the string which is placed around the bag to tie it to the catheter.

Impacted Calculi of the Ureter, Their Treatment and Result.—Dr. Alexander Hamilton Peacock, of Seattle, Wash., discussed the theory of the primary cause of calculi forming in the kidney and then wandering or descending the ureter. He said that the subsequent events depended upon the shape, size, elasticity, or the obstruction of the ureter from inflammatory tissue, stricture, or tumors. Naturally much depended upon the pathology of the ureter. Impacted calculi, namely, those which almost completely blocked the ureter and refused to pass a given point in seventy-two hours were those which the author considered in his communication.

The treatment consisted of meatotomy of the urethral opening, with dilatation of the ureter, injections of oil, or a ureterolithotomy. Rough, impacted calculi produced very definite trauma and often permanent injury to the ureter. Strictures resulted, infection of the kidney might take place, and nephrectomy might become necessary.

The pertinent point of the paper was: What constituted the best method of relieving impacted ureteral calculi?

Present Status of Hexylresorcinol as an Internal Urinary Disinfectant.—Dr. Veader Leonard and Dr. Austin Wood, of Baltimore, Md., presented a report of the clinical results obtained from the use of this drug, with illustrative cases classified on an etiological basis. The following points were discussed:

Experimental background and rationale of hexylresorcinol as an internal urinary disinfectant; experimental and clinical evidence of the superiority of olive oil solutions over other forms of administration, further observations on the mechanism of the bactericidal action of hexylresorcinol in the urinary tract; the significance of variations in the surface tension of the urine in relation to the interfering action of certain therapeutic measures commonly employed.

Bladder Reflux.—Dr. Daniel N. Eisendrath, of Chicago, presented the following summary and conclusions to an experimental and clinical study of bladder reflux:

1. By bladder reflux is to be understood the regurgitation backflow of bladder contents into the ureters and renal pelves.

2. The condition may be congenital or develop in postnatal life. That it is not a permanent affection is shown by the first case reported, where a marked reflux complicating atony of the bladder and

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Fig. 150
THE AKRON UMBILICAL TRUSS

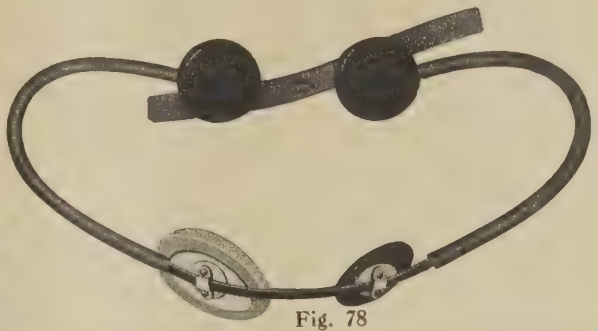

Fig. 78
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Fig 81

ARKON "COMFORT" Leather covered Hood Style Truss
on body in correct position for holding left side rupture. For right side rupture, Sponge Rubber Pad would come on opposite side and protective pad on left.

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due to spinal syphilis, entirely disappeared after appropriate local and general treatment.

3. Reflux plays an important part in carrying the infection from the lower to the upper urinary tract and explains the recurrence and resistance to treatment in such cases.

4. It may lead to an erroneous diagnosis of bilateral renal tuberculosis because it is a frequent complication of that disease.

5. It is extremely rare in normal individuals and during pregnancy. Acute and chronic cystitis favor it because of changes in the lower ureter preventing proper closure of the orifice on one or both sides.

6. In 91 cases including normals, pregnancies, and various vesical and renal conditions, reflux was only found in 5 or 5.4 per cent., most frequently in infections of the bladder and kidney, both tuberculous and nontuberculous. Obstruction at the vesical neck is a comparatively rare cause of reflux.

7. There is still much difference of opinion as to the reason why the mechanism at the ureterovesical junction, which normally opposes the reflux of bladder contents, should fail to function. Some hold that a hypertonic vesical musculature forces the ureteral orifices open. Some believe that a congenital insufficiency will explain all cases. A third group hold that changes in the wall of the lowermost portion of the ureter from lack of innervation or disease prevent the proper closure of the orifices. One must concede that all three of these may coexist, or even acting alone be sufficient cause for the phenomenon.

SECTION ON ORTHOPEDIC SURGERY

CHAIRMAN, DR. F. J. GAENSLEN, OF MILWAUKEE.
SECRETARY, DR. JAMES ARCHER O'REILLY, OF ST. LOUIS.

Birth Injuries Requiring Orthopedic Treatment.—Dr. Samuel W. Boorstein, of New York, said that by birth injuries he referred to traumatic injuries sustained during labor and delivery and in the common and necessary manipulation of the newborn. He emphasized the point that injuries sustained at birth often remained undiagnosed and thus the opportunity for treating at the most advisable time was lost. Hence he urged that the attending physician acquaint himself with the early symptomatology with the view of resorting to early orthopedic treatments when required. He discussed the following birth injuries: obstetrical brachial paralysis, fracture of femur, humerus, spine and cranium, torticollis and intracranial injuries. In the etiology of intracranial lesions he considered the trauma sustained at the delivery as the main cause. The early symptoms, he said, by which the spastic cases could be recognized were: The infants were restless and cried almost incessantly. Pressure upon the fontanelles produced respiratory distress, screaming or even convulsions. If the hemorrhage was not excessive, these infants refused to nurse. Nursing usually was poor and clumsy. Retinal hemorrhages, inequality of the pupils, squinting and nystagmus were often found.

For orthopedic prophylactic treatment he advised very early attention to the prevention of deformities, hence believed that the infants should be put in a double Thomas abduction frame with attachments to keep the shoulders abducted and rotated outward and provisions for increasing the abduction of the lower extremities, the feet at right angle, the elbow slightly flexed and wrist hyperextended on a splint.

In obstetrical brachial paralysis the author gave the following conclusions:

1. Obstetrical brachial paralysis was due to stretching or tearing of the cervical roots of the brachial plexus.

2. It was almost always associated with a difficult labor; in many instances, forceps having been used.

3. If these cases were treated early and properly, one might expect in the mild cases a good recovery in three or four months.

4. The more severe cases would require about six or seven months for a complete recovery.

5. Nerve operations were indicated if no advance was made in four months. After that period, if sufficient improvement was noticed, one might wait four months more, provided, of course, proper orthopedic treatments were continued.

6. The shoulder should immediately be put up in a splint or brace to prevent stretching of the paralyzed muscles and contracture of the unopposed muscles.

7. Even in the whole or the lower type, one might try conservative treatments for a while and then resort to a plexus operation. The result was not so discouraging as some textbooks would lead us to believe.

For fractures of the femur and humerus a Thomas Jones' splint, preferably with a half ring, should be used. The advantages were: It allowed easier transportation, permitted cleansing of the children and saved a great deal of watching. It permitted early massage. The deformity was easily controlled. The union probably occurred earlier on account of the ability of the infant to use the limb, to elevate it together with the brace. For fracture of clavicle a figure of eight bandage should be used; for fracture of vertebral column a Bradford frame. In reference to torticollis the author said that many of the cases might be caused by hematoma of sternocleido mastoid at birth. For treatments he puts up in a felt collar.

Dr. Boorstein's general conclusions were:

1. Many permanent injuries were traced to parturitional trauma.

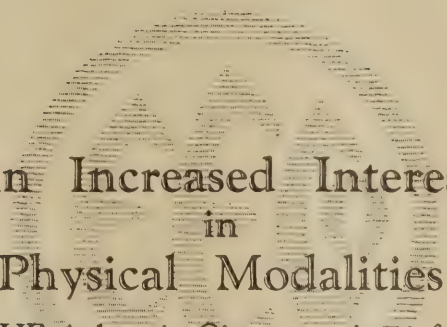
2. Many of these injuries could be diagnosed at birth if careful examination was made.

3. The obstetrician or the general practitioner should acquaint himself with the proper methods of prompt diagnosis so that early treatment could be instituted where necessary. If he himself could not diagnose the case, he should consult the orthopedic surgeon.

4. The spastic cases should be treated at once even when there was doubt that the mental condition of the child would ever be normal; one could not foretell how much mental recovery would be obtained.

5. The armamentarium of obstetrical service in the hospital should include the braces or wire splints necessary for immediate attention in these cases.

6. Cases of intracranial injury were treated by a double Thomas abduction frame with arm attachments.



An Increased Interest in Physical Modalities

THE Atlantic City meeting of The American Medical Association indicated a marked increase in the use of Physiotherapeutic methods. The papers presented at the meeting showed that the many ethical modalities which this branch of Therapy includes are opening up new methods of Medical Endeavor very rapidly Because the Engeln line of Diatherm and X-Ray Equipment was accorded so much attention we felt that a great many Physicians would be interested in seeing some of the new literature which describes this equipment, as well as reprints of articles which have appeared in some of the well known Medical Journals. These reprints together with our new publication "The Modern Science of Diathermy," will be gladly sent at your request.

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7. Obstetrical brachial paralysis was best treated by a plaster or an abduction splint keeping the arm in abduction and outward rotation. Later on massage and exercises should be instituted.

8. Fractures of femur and humerus should be treated with a small splint.

9. In fractures of the spine the patient should be kept on a Bradford frame.

10. Torticollis was prevented by a felt collar around the neck.

Neuroarthropathies of Peripheral Nerve Injury Origin.—Dr. Herman B. Philips, of New York, and Dr. Charles Rosenheck, of New York, presented a paper on this subject with a report of two cases and a lantern slide demonstration. They said that the condition was a new clinical entity, the two cases which they reported presenting striking similarity in histories, symptoms, laboratory findings and course. It developed, insidiously, after a severe local injury, in a person subjected to severe and oft repeated muscular strain. Diagnosis was made by the recognition of a combination of both physical and x ray findings of a neurotrophic joint with negative neurological and serological data, with a history of delayed onset after an injury. Marked swelling of the joint was present with distention of the synovial and bursal sacs. There was marked disintegration of the joint with destruction of the articular ends of the bones. Pain was absent or present to a slight degree not commensurate with the amount of destruction. In other words, the joints presented typical characteristics of Charcot disease or syringomyelia without confirmatory neurological or serological findings. The absence of the classical neurological and serological findings, in both cases, led to faulty diagnosis and treatment prior to our observation of the cases, and in one patient the shoulder was operated upon for supposed sarcoma.

These neuroarthropathies of peripheral nerve injury origin had a startlingly high incidence, occurring in two out of twenty-five consecutively observed cases of neurotrophic arthropathies observed by the authors. The incidence of this condition is twice as great as that caused by syringomyelia, there being but one case of the latter disease in their series. The authors believed that the unusual combination present in this clinical concept must be stressed so that the condition could be recognized and faulty treatment avoided.

Resection of Long Bones for Chronic Osteomyelitis.—Dr. George I. Bauman, of Cleveland, Ohio, presented a report of partial or complete resection of twenty-eight long bones in twenty-three patients suffering from chronic osteomyelitis. In this series there were resections of the femur, tibia, fibula, humerus, ulna and clavicle. The author discussed the possibility of regeneration after resection of the shaft in these various bones, and demonstrated special technic of operation and aftercare, with lantern slides showing the various stages of regeneration.

Mechanics of Back Strain.—Dr. Z. B. Adams, of Boston, Mass., read a paper on this subject in which he emphasized the following points:

1. An explanation of the type of cases considered.

2. An analysis of the motions permitted at the various levels of the spine.

3. A description of the structures which normally limited the direction and extent of these motions.

4. A description of two anatomical specimens which illustrated what happened when this mechanism was defective.

5. Suggestions as to what the treatment of this condition should be from the anatomical conditions which caused it.

Reconstruction and Plastic Operations of the Hip.—Dr. Fred H. Albee, of New York, said that in no other joint were the possibilities of reconstruction and plastic surgery greater than in the hip; yet, owing to the peculiar anatomy of this deepseated ball and socket joint with the most powerful muscles of the body acting upon it, such operations had only been attempted within the last decade. Modern additions to the surgeon's armamentarium, including the Smith-Petersen incision for approach to the joint, the Albee orthopedic fracture table and bone mill, and the introduction of bone grafts from one part of the anatomy to another, had so far widened the field that at present the limits were only set by the ingenuity and experience of the operating surgeon.

Two groups of cases were discussed; those in which operation aimed to maintain mobility, and those in which arthrodesis was desired. In the first group, ununited fractures of the neck of the femur, and congenital and acquired dislocations were included; also a rather unusual case of old arthroplasty for mobility of the hip, with subsequent dislocation was reported. The relative merits of the bonegraft peg and the Albee reconstruction operation were considered. In the author's opinion, the latter was preferable in ninety per cent. of cases. It offered a shorter convalescence, which was an advantage, especially in older patients. Moreover, if there had been extensive erosion of the bone, with loss of a considerable portion of the neck of the femur, and if the head was shortened, even though the bone graft operation might be technically successful, the anatomy of the parts had suffered to such an extent that range of motion at the hip, and the efficacy of the graft were necessarily impaired. The bone-muscle lever formed by the author's reconstruction operation more closely simulated the normal physiological lever than any device so far reported. The technic was given in detail, and also an illustrative case.

In cases of congenital or acquired dislocation in which the acetabulum was so shallow, or the head so faulty in shape that the head would not remain in place after reduction; and in cases in which the leg had been so shortened and the hip so far elevated that it was impossible to deliver the head into the acetabulum, it was necessary to construct an acetabulum higher up on the ilium, by means of bone graft wedges, by reshaping the roof of the acetabulum, etc.

Review of a series of seventy-five cases in which the author had produced arthrodesis of the hip led him to the conclusion that no joint in the body was better adapted to arthrodesis, or offered a better functional result. He had been performing such operations for various conditions, including arthritis deformans, tuberculosis in the adult, infectious arthritis, comminuted fractures, and paralytic conditions, for more than fifteen years, and was still surprised by the functional excellency of the late results. This group of cases afforded a very high percentage of thoroughly satisfied patients.

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The author first introduced the operation for arthrodesis of the hip at Budapest in 1909. Since then, in order to obviate delayed union, he had modified the original technic. The modified technic was described in detail. Three patients who suffered from adduction flexion deformity, with acute symptoms, and who had been treated by manipulation quite unsuccessfully, had obtained satisfactory results from arthrodesis.

Attenuated Bone Infections. Considerations in the Treatment of Osteomyelitis.—Dr. Walter M. Brickner, of New York, said that the phenomenon of attentuation and longevity in the bones of pyogenic bacteria was exquisitely illustrated in the chronic bone abscess, and was to be observed in other latent local and metastatic foci of osteomyelitis. In these conditions, especially, it afforded opportunities for conservative surgery—drill drainage of chronic bone abscesses, incision of subperiosteal abscesses, simple sequestrectomy, etc. The important pathological process in chronic osteomyelitis was bone necrosis. There was a definite causal relationship between this necrosis and suppuration. When all the necrosed bone escaped or was removed the suppuration usually ceased.

He believed that two important principles applied in the surgery of chronic osteomyelitis: First, the bone itself should not be attacked until a sequestrum had definitely formed; second, the simple removal of sequestra might be all that was necessary to effect healing, in spite of overhanging healthy bone. As a rule, sequestrectomy only should serve as a primary operation. The shallow bone trough might be required to effect definitive healing, but plastic osteotomy might be wisely deferred until its necessity and extent were definitely indicated.

Osteotomy could not be applied in all situations to eradicate bone cavities, which, however, sometimes closed up or closed over spontaneously. For an indolent cavity surrounded by a wall of dense bone Brickner suggested the drilling of small holes through that wall. In acute osteomyelitis extensive gutter osteotomy was not necessary, and scraping out the cancellous bone was to be severely condemned. Drainage could be provided through drill holes (trephinage) of sufficient size and number, or through bipolar trephinage; and suppurating medullaris may be adequately evacuated with gauze or irrigation.

Chronic bone abscesses might be medullary or cortical, he said, and at any level of the bone, and were rarely tuberculous; their symptoms were pain and bone tenderness, occasionally slight fever. He explained in detail how to recognize chronic medullary abscess. Chronic bone abscesses were usually residual from, and gave symptoms years after, acute osteomyelitis. Brickner illustrated, however, a series of solitary, chronic, sterile, cortical abscesses of the femur without any discovered antecedent infection. Chronic bone abscesses were usually sterile or nearly so. Osteotomy was therefore not necessary for their cure, in the author's experience. His method of treatment by simple evacuation through a small drill hole had been uniformly successful even in his nonsterile cases. The author's technic, which had previously been published, was again described in some detail.

Diathermy in Joint Injuries.—F. H. Ewerhardt, of St. Louis, discussed first the more generally known forms of heat, conductive, convective, and conversive. Conduction, he said, was that form of heat which was conveyed to the body by virtue of direct contact with a superheated substance. Convective heat radiated from a source approximating, but not in contact with, the body. The numerous so-called bakers, whether heated by gas burners, or electrical resistance wires of electric light, were forms of convective heat. With respect to the latter a qualifying statement was essential. Light from the viewpoint of heat producing agency, operated in two distinct and definite ways, which placed it in two of the three groups. That part of the heat which was generated as a result of meeting resistance in its passage through the glass bulb and the air intervening between the source and the part to be radiated, was distinctly a form of convective heat, while the remaining rays, visible and invisible striking the skin penetrated it, and meeting increased resistance were in turn converted into heat, thus forming and belonging to a third type, namely, conversive heat. This form might be defined as one in which light or electric energy, in its passage through human tissue was converted into heat. By the term diathermy was meant the process of heating through the tissues as contrasted with convective and conductive heat. The source of diathermy was a high frequency current of high voltage and relatively low amperage. The strength of the current used might be any part from one hundred to three thousand milliamperes. The extreme high rate of alterations or oscillations might range from one half to two million a second and were so far removed beyond the point where human tissue responded either by muscular contraction or electrolysis, that the result was a conversion of the electric energy into heat energy. For these reasons it was not correct to speak of diathermy as being an electrical treatment *per se*.

The physiological effect of convective and conductive heat was a vasomotor dilatation followed by a venous stasis and frequently by free perspiration. The heat, however, penetrates barely beyond the dermis for here the abundant vascular system dissipated it to other parts of the body. Wherever a relaxation of the superficial tissues was desired, this form of heat was indicated.

The action of radiant light and heat for localized purposes was much the same as that of conductive heat with the difference that the light rays possessed a definite power of penetration, some deeper than others, and were then converted instantly into heat, and though a considerable quantity of it was carried off by the blood stream, yet much of the total volume was carried deeper into the tissues. Diathermy, the author repeated, was a means of heating deep tissues by means of a high frequency current which passed from one electrode to the other in straight lines affecting whatever tissue intervened. He believed that the method should appeal to the surgeon who believed in the efficacy of the functional treatment of fractures and joint injuries.

Ewerhardt's conclusions, based on an experience of two years in the physiotherapeutic department of the School of Medicine, Washington University, were as follows:

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"3. That patients take kindly to it, are favorably impressed with the procedure, and their cooperation is more easily secured where movements and massage are indicated.

"4. That unquestionably the period of convalescence in the treatment of fractures is materially reduced.

"5. That its application seems indicated in postoperative bone and joint conditions, acute sprains, fractures, and bursitis; acute and chronic arthritis, and in treating contractures, fibrositis, and myositis ossificans.

"6. It is contraindicated in cases of pus sac without drainage, where there is danger of hemorrhage, and in tuberculous joints and suspected malignancy."

SECTION ON SURGERY, GENERAL AND ABDOMINAL

CHAIRMAN, DR. EVARTS A. GRAHAM, OF ST. LOUIS.
SECRETARY, DR. J. TATE MASON, OF SEATTLE, WASH.

Diaphragmatic Hernia.—Dr. Carl A. Hedblom, of Madison, Wis., presented a review of 378 cases of diaphragmatic hernia in which the patients were operated upon. He summarized his findings as follows:

Nineteen of the cases were from the Mayo Clinic and 359 from the literature. Excluding those due to war injuries 60.1 per cent. were due to trauma, 14.7 per cent. were congenital, 14.8 per cent. were acquired, and 10.3 per cent. were of indeterminate origin.

Among the patients were twenty-two children under ten years of age. The duration of the symptoms in the traumatic cases was three years or under in about eighty per cent. while in those of congenital and acquired origin it was more than three years in fifty-four per cent. In a considerable proportion of the cases of traumatic origin there was a latent period between the injury and the onset of symptoms of hernia and in a large proportion months or years elapsed before operation.

The symptoms and signs in diaphragmatic hernia were variable. All the abdominal organs except those in the pelvis were a part of the hernia content in some cases. The stomach was herniated in 194 cases, the colon in 158, intestines in 56, spleen in 24. A sac was noted as present in 24. Of abdominal symptoms, pain, vomiting, constipation, and distention were most common; of those referred to the thorax, pain, dyspnea and dysphagia were the most frequent.

Tympany and dullness to percussion, heart displacement and splashing and gurgling in the thorax were the most constant physical findings. Not infrequently the physical findings were very few.

Diagnosis was made on clinical or x ray findings in 59.5 per cent., at operation in 30 per cent., postmortem in 6.3 per cent., and uncertain 4.1 per cent. The diagnosis was made late in the cases eventually recognized.

Laparotomy was performed in 40.3 per cent. thoracotomy in about 39.2 per cent., and some combination of laparotomy and thoracotomy in 20.4 per cent.

The hernia opening was centrally situated in 22.7 per cent., lateral in 29.6 per cent., posterior in 13.5 per cent., and at the esophageal hiatus in 20.2 per cent. and variously situated in the remaining cases. There were six cases, three in the Mayo clinic series, of parasternal hernia.

The hernia opening was sutured in 72.6 per cent. of 362 cases, reduced but not sutured in 11.8 per cent., could not be reduced in 9.6 per cent., and was found at necropsy in 5.8 per cent. The hernia was successfully repaired in 49 per cent. of 146 cases subjected to laparotomy and in 89.4 per cent. of 142 cases in which the thoracotomy approach was used.

Of the nineteen patients operated upon at the Mayo Clinic, fifteen recovered from operation, two with congenital absence of the left diaphragm died one and eight years after operation, respectively, one recurred but has been symptom free since the second operation. Twelve patients have remained free of symptoms of recurrence. Four, twenty-one per cent., died of shock, cyanosis, pulmonary embolus and sepsis, respectively.

Of the total number 251 patients (66.4 per cent.) recovered from operation, but in 42 of these cases no attempt was made to suture the hernia.

The operative mortality in 126 obstructed patients was 53.1 per cent.; in 252 who were nonobstructed it was 23.8 per cent.

The operative mortality excluding obstructed cases and those with omentum prolapsed through the chest wall was 22.3 per cent. following laparotomy, and 19.8 per cent. following thoracotomy.

End results were reported in a small percentage of cases. Of twenty-three patients in whom the opening was closed by suturing an adjacent organ into it, four were reported to have died later of intestinal obstruction and in four the hernia recurred.

The author drew the following conclusions:

1. The etiology of diaphragmatic hernia was often obscure, its pathological anatomy diversified and its clinical manifestations manifold.

2. About two thirds of the reported civilian operated cases in which the etiology could be assigned had been due to a penetrating wound or rupture of the diaphragm, by sudden greatly increased abdominal pressure, one sixth were congenital and one sixth acquired.

3. A large proportion of the reported operated cases were recognized only after symptoms had been present many years. A considerable proportion were unsuspected until discovered at operation, sometimes after a number of previous operations, and some were disclosed at necropsy.

4. The failure to make an early diagnosis was doubtless due in some measure to the variable and uncertain clinical manifestations but probably for the most part due to the fact that the condition was not considered in the differential diagnosis. The

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history of a penetrating wound of the lower thorax, of a crush, collision, or fall, or the presence of symptoms referable to the abdomen or thorax or both should suggest the possibility of diaphragmatic hernia in every case in which the diagnosis remains in doubt.

5. In the differential diagnosis chief reliance must be placed on the röntgen ray demonstration of an abdominal viscus in the thorax following administration of a meal or enema opaque to the röntgen ray. Failure to demonstrate the hernia röntgenologically might be due to spontaneous temporary reduction, to the failure of the opaque substance to enter the herniated viscus or to the presence of a solid viscus only, such as omentum, in the hernia.

6. In the absence of definite contraindications an exploratory operation should be performed if diaphragmatic hernia was suspected and following a positive diagnosis even if the symptoms were slight. In a large proportion of cases obstruction finally developed and that complication at operation more than doubled the postoperative mortality, limited what might be attempted in the way of repair of the hernia and often necessitated secondary operations.

7. The choice between laparotomy and thoracotomy, in the author's opinion, depended on the nature of the case. In obstructed cases in which the cause of the obstruction was in doubt, exploratory laparatomy was indicated. If the hernia opening had been demonstrated to be parasternal, laparotomy furnished the most direct and practical avenue of approach. In cases due to a recent wound with prolapse of omentum through it, thoracotomy was the most direct approach and might be combined with a transdiaphragmatic exploration for injury to abdominal viscera. In the ordinary nonobstructed cases thoracotomy had yielded a somewhat lower mortality than laparotomy and successful closure had been effected in a much larger proportion of the cases following thoracotomy than following laparotomy. A combined thoracolaparotomy might be necessary to effect reduction and closure but such combined operation had resulted in a very considerable increase in operative mortality.

8. In more than ninety per cent. of the cases in which operation had been performed, there was no sac. In such cases the objection to thoracotomy because of operative pneumothorax produced was largely obviated for the reason that an operative pneumothorax was produced also through the laparotomy wound, the moment the hernia was reduced. Furthermore, the presence of abdominal viscera in the pleural cavity for months or years, probably in most cases, resulted in compensatory changes that increased the normal limit of tolerance to open pneumothorax. In any case the objection to thoracotomy on the grounds of pneumothorax was largely obviated by the use of positive pressure intrapharyngeal insufflation anesthesia, which amply sufficed to maintain respiration and to reinflate the lung if it was still expansile.

9. If possible the hernia ring should be sutured. Obturation of the hernia opening with some abdominal viscus was a makeshift which had resulted in a relatively large number of known recurrences. Suturing the stomach to the abdominal wall had proved ineffective in preventing its prolapse and was of no avail in preventing herniation of other viscera.

10. A few cases of large or recurrent hernia openings had been successfully closed by fascia transplants or muscle plastics. Very large openings, including cases with absence of the diaphragm on the left side, possibly might be closed by a plastic operation following extraplural thoracoplasty of the lower thoracic wall by extensive rib resection done as a preliminary operation.

11. Regardless of whether a thoracotomy or a laparotomy had been performed, the air should be aspirated from the pleural cavity after it had been closed. Even if the collapsed lung would not re-expand the negative tension produced probably in most cases would increase the negative tension and so increase the respiratory capacity on the opposite side. Atmospheric tension exerted on the mediastinum from the side of the collapsed lung added to the increased intraabdominal pressure due to returning the herniated viscera and postoperative distention might reduce the respiratory capacity beyond the limit of safety.

12. Recurrences following repair of diaphragmatic hernia had been reported in about five per cent. of the cases. Most recurrences were probably due to incomplete closure or to tension on the suture line.

13. The operative mortality had been due in large measure to late operation in the presence of obstruction, to shock and to respiratory failure. Early operation before obstruction had occurred, measures to prevent shock and differential pressure anesthesia and precautions against postoperative respiratory embarrassment should, therefore, greatly reduce it.

14. Operation for diaphragmatic hernia, whether laparotomy or thoracotomy, usually involved the technical consideration and problems of pneumothorax.

Amebic Abscess of the Liver.—Dr. Alexius McGlannan, of Baltimore, Md., presented a paper on this subject, with report of a case complicated by subphrenic abscess. Amebic disease of the gastrointestinal tract, he said, was usually associated with tropical maladies, but was often found to originate in temperate zones. The ease and speed of travel made dissemination easy. The surgeon's interest was centred on the complications and sequelæ of intestinal amebiasis rather than on the primary disease. The specific action of emetine on the Ameba histolytica had reduced the need for appendectomy and ileostomy.

Liver abscess was the most common sequel of the bowel disease. The pathogenic ameba had been found in the skin, in chronic bone lesions and other remote localities. The possibility of ameba causing gastric and duodenal ulcers was suggested.

Both the portal vessels and the transperitoneal route were given as the means by which the ameba traveled from the bowel to the liver. Amebic hepatitis and abscess were considered with regard to symptoms and emetine therapy and the importance of recognizing amebæ in the contents of an abscess. The author described treatment by means of open and closed drainage and the local constitutional use of amebicidal drugs.

He spoke of the complications of liver abscess, and the rarity of subphrenic as compared with intrathoracic abscesses. In commenting on the case reported, he referred especially to the usefulness of emetine in the successful treatment of this condition.

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SECTION ON GASTROENTEROLOGY AND PROCTOLOGY

CHAIRMAN, DR. RALPH W. JACKSON, OF FALL RIVER, MASS.

SECRETARY, DR. FRANK SMITHIES, OF CHICAGO.

The Correlation of Proctology with Other Specialties.—Dr. Ralph W. Jackson, of Fall River, Mass., in his chairman's address, said that proctology, as a specialty, had many independent problems, and was as often correlated with other specialties as with gastroenterology. Irregular more than regular practitioners had recognized this, and made profitable use of it. A society devoted to proctology alone had done much to advance the specialty, and the American Medical Association had recognized its legitimacy in a section including it, but should go further. The relation of anorectal work to other lines of specialization was brought about through anatomical proximity, blood and lymph channels, and neural connections. Through these, proctology was often correlated with gynecology, urology, pediatrics, orthopedics, dermatology, neurology and tuberculosis. These correlations made proctology as important a field of work as stomatology, which had a section of its own. Proctological papers on the programs of the Section on Gastroenterology and Proctology had been too few. More papers and their publication would foster the ethical growth of the specialty.

Stool Examinations for Protozoa in Inmates of a New York State Institution.—Dr. Walter S. Thomas and Dr. E. A. Baumgartner, of Clifton Springs, N. Y., reported that in a single examination of stools from 1,122 inmates of a New York State school for feebleminded women protozoa were found in 499 cases, or 44.4 per cent. Amebæ were encountered in 36.3 per cent., and flagellates in 23.7 per cent. Ciliates were not seen. Of the amebæ the entameba coli and endolimax nana were found in 17.8 per cent. and 17.7 per cent., respectively, while the entameba histolytica were present in only 1.07 per cent. Of the flagellates the chilomastix mesnili was seen oftenest, in 21.0 per cent., the giardia lamblia in 2.4 per cent., while the trichomonas hominis was seen only three times or in 0.26 per cent. of the cases.

That there was cross infection in the institution was shown by the relatively low incidence in the recent arrivals with a steady rise during the first year of residence after which the curve became flat.

The protozoon most often seen was the chilomastix mesnili; this differed from the figures of other observers and was explained by the fact that the stools with few exceptions were examined very shortly after they were passed, the organisms were still motile and therefore easily recognized.

The authors considered the most important findings to be the low percentage of entameba histolytica. Since this low rate occurred in a class of patients where the highest rate might be expected, in an institution where cross infection was evident, and since in none of the cases were there symptoms of amebic infection they concluded that in residents of New York State the entameba histolytica was an insignificant factor in the causation of disease.

Hydrogen Ion Concentration of Stools; Its Estimation and Clinical Value.—Dr. William H. Foreman, Dr. Walter E. Pennington, and Dr. Arthur G. Funkhouser, of Indianapolis, Ind., presented a comprehensive paper on this subject in which they stated that hydrogen ion concentration gave a more definite index of stool acidity than did any method of titration. This might be rather simply determined by the calorimetric method described by Nelson and Wilson in 1917, but using indicators not excessively sensitive to protein. The pH of the stool varied with the type of stool, ranging from above seven in the formed, solid stool to near five in the soft and liquid types. The pH of the stool influenced the pH of the urine and in diarrheas, reduced the Co_2 combining power of the blood.

The pH of the stool was modified by the character and reaction of colon wastes. The colon wastes were determined by: a, the chemical reduction and absorption of food, and rate of food and waste passage; b, continued enzmatic action and absorption in the proximal colon; c, the maintenance of a solid residue in the remainder of the colon. This necessitated a careful study of disease, chemical stimulation; the intestinal flora; fermentation and putrefaction; storage and elimination.

With the acid stool (pH 5.6-7.0), usually unformed, soft and agassy, the patient complained of digestive, systemic, nervous and psychic symptoms—a fairly definite but slightly varied syndrome. When by treatment the stool pH was reduced to neutral, the digestive, systemic and psychoneurotic symptoms are relieved, and the patients markedly improve in health.

Treatment was by dietary and digestive measures, the proper control of bowel wastes, and symptomatic treatment.

Lantern slides were used to demonstrate the principal points.

The Differential Diagnosis Between Cancer and Other Gastric Conditions Associated with Subacidity.—Dr. Seymour Basch, of New York, spoke of the importance and difficulty of making a correct early diagnosis of gastric cancer. The clinical conception of this disease, he said, included a diminution and subsequent disappearance of normal acidity and its later replacement by lactic and other organic acids. There was frequently confusion with pseudocancerous conditions, especially those associated with subacidity, and to aid in distinguishing between the subacid type of cancer and the subacid conditions, a brief discussion of the chief clinical manifestations of this type of gastric cancer was given. For the purposes of simpler discussion of the differential diagnosis, these last named were considered under two divisions: a, those associated with tumor formation, namely, sarcoma, benign tumors, tuberculosis and syphilis, and, b, those without tumor formation, namely, chronic gastritis, benign achylia and pernicious anemia. Detailed discussion of the differential diagnosis of each disease from gastric cancer.

The author's conclusions were:

1. Unless the presence of a cancer in the stomach had been positively established, the possibility of a noncancerous process should receive equal con-

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sideration. 2. Exploratory laparotomy was particularly urged whenever a careful study of a suspicious subacid case presented some feature which did not fit into the classical picture of gastric cancer. 3. This was particularly true in very early cases, for whether the process was cancerous or not, the patient's chance of recovery in surgical gastric affections was in direct proportion to the earliness of the operative procedure.

Some Reasons for Poor Results Following Gastrointestinal Surgery.—Dr. Russell S. Boles, of Philadelphia, said that the literature abounded with evidence showing that the results of operation for chronic appendicitis, gastroduodenal ulcer, and gallbladder disease were often disappointing. The reason operation failed to relieve symptoms was that the fundamental cause of the trouble had not been discovered. Isolated pathology in one organ of the gastrointestinal system rarely occurred. Focal infection and biliary and intestinal stasis paved the way for the development of chronic gastrointestinal disease. In addition, such constitutional abnormalities as a disordered sympathetic nervous system, neurasthenia, cecum mobile, gastroenteroptosis, redundant sigmoid, and familial predisposition, were important etiological factors. The management of these cases before and after operation reduced itself to four main essentials: 1, Eradication of the foci of infection, especially those of the teeth, tonsils, sinuses, upper respiratory tract, appendix, gallbladder, and colon; 2, elimination of intestinal stasis; 3, elimination of biliary stasis; 4, application of measures such as would improve the general condition of the patient.

In a large proportion of cases in which therapeutic biliary drainage was employed, decided benefit was secured. In cases of intestinal stasis, properly performed colonic irrigation had given striking alleviation of symptoms in the majority of cases. In ileal stasis, transduodenal lavage, by the Jutté method, afforded considerable relief. Diet was of paramount importance, one low in cholesterol being especially indicated in disease of the biliary tract. Only by such comprehensive management might recurrence of symptoms, reactivation or formation of ulcer, and recurrence of gallstones be avoided. Operation in all such cases must be looked upon as only an incident in the treatment of the patient. The pathological conditions mentioned were frequently merely an end result, and surgery alone could not be expected to effect a cure.

Therapeutic Value of Nonsurgical Drainage of the Biliary Tract.—Dr. B. B. Vincent Lyon and Dr. William A. Swalm, of Philadelphia, reviewed this method of treating disease of the gall tract, tracing its evolution from a diagnostic to a therapeutic procedure. They discussed the proper selection of cases of various types of the disease for surgical and nonsurgical management, pointing out the necessity in many cases of combining the two methods. The three vicious circles in gall tract disease were considered, the first responding to surgical procedures, the second and third to nonsurgical. Failure to recognize this led to postsurgical relapses and the necessity for reoperation.

The authors contrasted the value of intermittent with continuous nonsurgical drainage, and discussed very fully the present methods used, with observations on the physiology of the liver. In regard to the amount of bile secreted by the liver, the authors reviewed the results secured in 376 cases. The paper was well illustrated with lantern slides.

Subtotal Gastrectomy.—Dr. John B. Deaver, of Philadelphia, said that subtotal gastrectomy, formerly reserved for malignant disease of the stomach, was now much in favor for benign diseases, especially chronic gastric and duodenal ulcer and their sequelæ, such as, hourglass stomach, pyloric stenosis, secondary or marginal ulcer. The end results of the radical operation had proved so satisfactory in the hands of the author, that he now used the method whenever feasible.

The symptoms of gastric ulcer were not so well defined as those of the typical duodenal ulcer, so that diagnosis presented some difficulty. That the röntgenogram did not always demonstrate the presence of a gastric ulcer was illustrated by a recent experience.

In the case in point pylorospasm had caused pyloric obstruction as shown by x ray study. But the latter had failed to demonstrate the small ulcer which at operation was found on the lesser curvature of the stomach. Palpation of the pylorus at operation had even aroused the suspicion of a second ulcer, as the cause of the enlargement. But it was not found. A subtotal gastrectomy was done. Examination of the specimen showed three eighths of an inch thickening of the muscularis and submucosa of the pylorus.

Subtotal gastrectomy, Deaver believed, was the operation of choice for operable cancer of the stomach, which meant the early stage before metastasis had developed. A diagnosis or suspicion of cancer warranted exploration. Delay was dangerous, while exploration was not. If the latter failed to reveal the cancer, so much the better, but it would most likely reveal sufficient pathology to account for the symptoms, and its removal will afford a chance, and a very good one, for relief. A palpable gastric tumor did not necessarily mean inoperable cancer, especially if the growth was a small one located at the pyloric end of the stomach. Large growths at the cardiac end, of course, preclude gastric resection. Gastroenterostomy for cancer of the stomach served no purpose unless the pylorus was obstructed. When such was the case, it was a warranted measure provided the condition of the patient permitted.

Normal Gastric Digestion.—Dr. Martin E. Rehfuss, of Philadelphia, spoke on new conceptions regarding gastric function. He believed the stomach to be fundamentally the organ of food digestion. He discussed the theories of Meunier, Dodds, Bolton and others, regarding certain gastric phenomena, and gave a summary of a complete study of gastric digestion as performed in the department of physiological chemistry of Jefferson Medical College, with unpublished data completing the normal digestion table. He also presented secretory and motor tables of foodstuffs, and gave röntgenological and intubation evidence regarding normal, fast, and slow stomachs. He gave what he considered the probable explanation for intragastric phenomena as revealed by intubation, showing clearly three periods. These were studied in detail, as a basis for the interpretation of pathological data.

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SECTION ON NEUROLOGY AND PSYCHIATRY

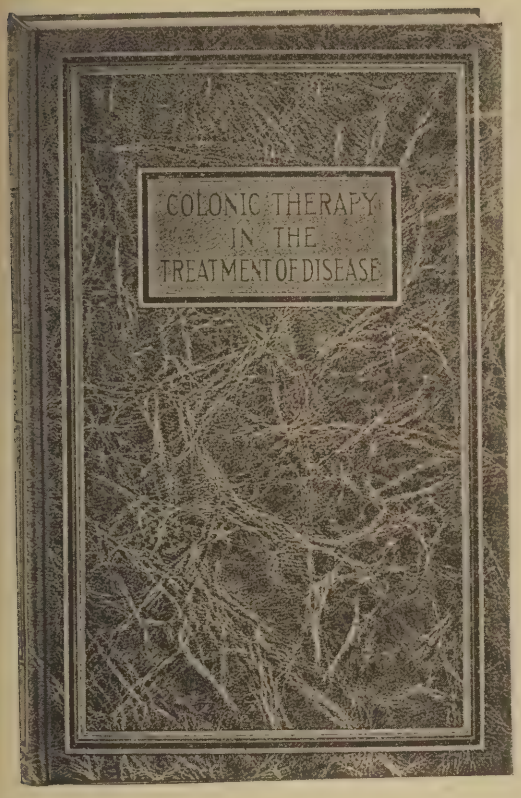
CHAIRMAN, DR. EDWIN G. ZABRISKIE, OF NEW YORK.
SECRETARY, DR. LEWIS J. POLLOCK, OF CHICAGO.

Meralgia Paresthetica; Its Relation to Osteoarthritis of the Spinal Vertebræ.—Dr. Charles Rosenheck, of New York, said that the former and present day conception that meralgia paresthetica was a peripheral nerve affection involving the external cutaneous nerve of the thigh must be abandoned. The vague causes that had been assigned, viz., trauma, infections, pregnancy, flat feet, and other ill defined states, as being responsible for the meralgic syndrome, must also be discarded. Since Roth and Bernhardt in independent contributions described the affection and stressed the rôle which the long course of the external cutaneous nerve and its relation to the fascia lata played in the causation of meralgia, every writer on the subject and every textbook had copied this glaring inconsistency. Neither the long course of the nerve or its exposed position or the other vague causes mentioned were the etiological factors concerned. In a series of twenty-five cases of meralgia paresthetica it had been proved that the affection was radicular in nature and its origin or etiology might be traced to inflammatory deposits in the intervertebral spaces. Osteoarthritis of the spinal vertebræ, particularly the lumbar segments, had been found in the series studied. This had been proved clinically and by röntgen ray.

Alteration of Character, Disposition and Behavior as a Sequela of Encephalitis Lethargica.—Dr. Alfred Gordon, of Philadelphia, said that encephalitis lethargica might be followed by a psychosis which could be considered as an akinetic expression in the psychic activities analogous to the akinesia in the motor sphere characteristic of the encephalitis. The condition might simulate a depressive psychosis or a demented state. Besides the purely psychotic phenomena analogous to those observed in the classical psychoses there was another set of manifestations observed especially in young persons, which had reference to alteration of disposition and of the personality in general. To demonstrate the latter the author reported in great detail the histories of seven cases all showing postencephalitic sequelæ in the domain of the emotional sphere. The author believed the outstanding features of the disorder to be: Aggressiveness, hostility, impulsiveness, outbursts of excitement or anger, restlessness, discontentment, tendency to misrepresent or frankly to lie without any specific motive, tendency to misappropriate or to steal, and excessive eroticism. This group of symptoms, which could be called psychomotor instability, had this characteristic feature that it did not occur periodically as had been observed in psychotic states, but it presented a continuous condition without intervallary periods similar to purely motor manifestations of lethargic encephalitis in which the symptoms existed for a long time without modifications. These symptoms might be individually encountered in some of the classical psychoses but collectively they could not be identified with the latter. They constituted a clinical entity apart, because they involved exclusively the domain of emotional forces but not the intellectual forces. The latter were invariably intact in every one of the cases reported. A careful mental examination failed to reveal any disturbance whatsoever in the association of ideas or of judgment. In all such cases one witnessed a distinct dissociation between the psychomotor instability and the integrity of the intellect. As to affectivity, it might at first glance appear to be involved so as to give the impression of a true psychosis in its early development but contrary to what was observed in the latter; in the postencephalitic cases the patients were very sensitive to the consequences of their deviations from the proper conduct, they expressed genuine regret and showed a state of anxiety and painful criticism of their behavior which was not voluntary, not thought out or deliberate; otherwise speaking, these manifestations were not the result of a fundamental mental disorder, they were but the expression of a morbid emotional state and the effect was here involved only in its reactions and in the power of execution but not in its central power.

The next point of interest emphasized by the author was the prognostic outlook of the personality disorder. The seven cases upon which the present study was based showed that the individuals whose previous personal and family histories presented psychotic phenomena, had an unusually long duration of their postencephalitic disturbances. On the other hand the patients whose antecedents were normal, made a complete recovery. It seemed, therefore, that the postencephalitic cases followed the same laws as hereditary influences from any source. The author expressed an opinion that these emotional manifestations might find their physiological explanation in the alteration of the basal ganglia which, according to many writers, were ordinarily concerned in emotional phenomena. It seemed that the behavior disturbances were organic in nature and were a counterpart of the motor disturbances following encephalitis. The accumulated observations pointed more and more to an organic rather than to a psychogenic conception of postencephalitic behavior phenomena.

Parkinsonian States.—Dr. George B. Hassin and Peter Bassoe, of Chicago, presented a clinicopathological study of two large groups—paralysis agitans proper and postencephalitic syndromes, which they considered as Parkinsonian states. A comparative study of four such cases, one of paralysis agitans and three of the postencephalitic variety, was undertaken with a view to determining whether the forgoing conditions were identical pathological entities and whether they possessed a definite localization. The study of the four cases showed that pathologic changes though present in all, were not alike, regardless of the fact that in three cases the duration of the illness was the same—three years. In one case, for instance, the substantia nigra was markedly involved; in two, slightly, while in that of paralysis agitans it was involved not more than any other portion of the central nervous system. This last case differed from the postencephalitic variety in the absence of inflammatory phenomena which in the postencephalitic cases were combined with diffuse degenerative changes. As the process was more or less diffuse, it was hardly possible to speak of a definite localization. It was certain, that the latter was not in the pyramidal system and that the extensity of the



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pathological changes might depend on the time element—the duration of the disease in each individual case.

Encephalitis Lethargica.—Dr. William Browning of Brooklyn, discussed a common etiological factor of encephalitis lethargica and its relation to prevention. He said that as neither the infecting organism nor the clinical causes had been established, accessory circumstances deserved study. His paper was based on twenty-seven private cases, twelve of which were a recent consecutive series. In these overwork and underrest proved to be a common causative element, most constant and demonstrable being loss of sleep. The normal sleep requirement varied slightly, but eight hours out of twenty-four was a minimal average standard. In the cases where this was calculated the amount obtained was less than seven hours in twenty-four, often much less. A single interruption of forty-four to forty-eight hours at a stretch could do the same thing. The difficulty was to ferret out the night habits of persons, usually impracticable in institutional and chronic cases. These nocturnes denied everything. The individual physician was more likely to be trusted with confidences. Many modern innovations tended to limit sleep, for instance, the radio, phonographs, automobiles, telephones, movies, crossword puzzles, changes in social customs, increase of studies and examinations, growth of urban life, and so on. Bad air, as in subways, and foolish talk against sleep add to the evil.

In line with this, a preliminary stage, lasting a month to a year or more, was not uncommon. This should permit recognition and relief of impending trouble. Knowledge of this factor proved useful in diagnosis. It neither negatived nor confirmed the theory of infection, but provided the soil or basis on which the disease developed.

Susceptibility proved to be due to excesses of this type, rather than to any great difference in immunity. Physicians for example, became affected, not from contact, but because of sleep interruptions and irregularities of living to which they were subjected.

Prophylaxis was largely a personal matter, except in some callings.

The Psychiatric Clinic in the General Hospital.—Dr. Irving J. Sands, of Brooklyn, N. Y., said that the purpose of the psychiatric clinic was to treat those mentally sick who did not require residence in a mental hospital, to manage the psychoneurotics, and the problem children, to guide the mental defectives, and to furnish information on general mental hygiene. Mentally sick people often refused to go to a psychopathic ward or hospital for treatment, but offered no objection to visit the dispensary attached to a general hospital. They always required a general physical survey and often a thorough serological study. Physicians were the first to whom the family turned for help. The range of the psychiatric knowledge of the general medical practitioner was limited. He was constantly in need of information on psychiatric subjects. During the past decade intelligent laymen had intense and increasing interest in mental hygiene, not only in its application to the problem of insanity but also to delinquency and criminology. Charity organizations, social service agencies, school authorities, and courts of justice were frequently seeking psychiatric advice in the management of their particular problems. When properly conducted, the psychiatric clinic in the general hospital would supply this want. Furthermore, by adequately treating the psychoneurotics and maladjusted, the clinic would prove an effectual weapon in combating the ever increasing numbers of quacks, illegal practitioners of medicine, and faddists.

Tonic Neck Reflexes in Tuberculous Meningitis.—Dr. I. S. Wechsler, of New York, discussed the clinical application of the tonic neck reflexes of Magnus and de Kleijn to tuberculous meningitis. He found the neck reflexes in a little less than half the number of cases in which he tried them and expressed the belief that they had some little clinical value.

Radical Cure of Neuroticism in Children.—Dr. Tom A. Williams, of Washington, D. C., said that the clinical evidence that neurotic manifestation could be permanently abolished in individual children was adduced in a number of papers in 1909, and was receiving the acquiescence not only of other clinicians, but the support of biological experimentation. Thus, zoologists and botanists had demonstrated that there was no fatality even about deeply rooted specific characteristics. They could determine by external causes the polarity of a germ cell and could alter its symmetry. They showed that the change of one structure altered the whole organism. Even a few hours' exposure to light, for example, of one part of an embryo would change the whole of it, even to the extent of the head taking the place of the tail. But even exuteral biological changes could be affected; thus, the transplanting of an ovary would cause the disappearance of male secondary characteristics already formed and the appearance of female characteristics. By modifying the diet in infancy, permanent changes of the individual could be induced, irrespective of heredity.

A universal alteration of every object to stimuli was not confined to those of mechanical or chemical nature, however, said the author. Dynamic stimuli were just as effective. Psychological experimentalists had proved that even the fundamental reflexes of pupil, gland and tendon could be modified. This could be done by adding to the sensation which aroused the reflex of other sensations simultaneously until gradually it was found that the latter became capable of arousing the reflexes without the former. This process was called association. By this means any stimulus might be made to arouse any response. It had long been known that every perception had its accompanying feeling tone, and that this latter manifested vasomotor changes and alterations in visceral states. The feeling tone aroused by any experience arose from only a small section of the whole experience. In virtue of this principle, devastating or inhibiting emotions became attached to what might appear to others to be simple everyday incidents, thereby producing a reactivity which was called neuroticism.

What could be conditioned in that way, he said, might be deconditioned or reconditioned in the

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and your prescription is filled by some cheap, worthless substitute which some druggists buy in bulk, your efforts are defeated and your patient's condition is jeopardized. You owe it to yourself as well as to your patients to make sure that they get

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same way. The principle was easily comprehensible in a common fear, such as that of dogs, but it was no different when the fear appeared almost groundless. The phobia might wear an absurd garb, but within this was a real basis of dread which proper exploration of the patient's psyche would reveal.

The author cited examples of reconditioning through dynamic stimuli, through the bringing of a new element into the situation which had provoked the neurotic behavior. That element was a new feeling toward a conditioning on the part of the child gained by a newer perception of certain elements in the situation which had formerly perturbed him. In common language it was called understanding. The psychiatrist was a new element in the environment which permanently changed the patient in such a way that he responded differently to formerly hurtful surroundings. He had received light which changed him, just as light changed the formation of the experimental embryo. He had gained an immunizing power which enabled him to change hurtful elements of situations into helpful ones.

SECTION ON DISEASES OF CHILDREN.

CHAIRMAN, DR. EDGAR J. HUENEKENS, OF MINNEAPOLIS; SECRETARY, DR. HUGH MC CULLOCH, OF ST. LOUIS.

Neonatal Pyelitis.—Dr. L. W. Sauer, of Evanston, Ill., said that despite the wealth of contributions on pyelitis in children in recent years, only rarely had neonatal pyelitis been referred to. The author's brief clinical report was based on fifteen cases (thirteen males), he said, seen in private practice in the past six years. The disease was probably not uncommon, and its early occurrence in otherwise normal male infants lent support to the hematogenous route of infection. Bacillus coli was found in fourteen instances; Bacillus enteritidis in one. Symptoms were usually referable to the gastrointestinal tract or to the central nervous system. Continuous alkalinization of the urine proved successful in thirteen uncomplicated cases within six to ten weeks after diagnosis. In one fatal case death was due to Bacillus enteritidis meningitis; in the other fatal case the urinary tract showed a congenital stricture of the right ureter—a probable factor in the fatal outcome.

X Ray Treatment of Pertussis.—Dr. Lawrence Weld Smith, of Boston, presented an analysis of 850 cases of pertussis treated by x ray. The author said that his findings proved that this method of treatment was of value in reducing the number and severity of the paroxysms and in shortening the course of the disease; that the majority of the cases occurred under seven years of age (750 cases); that most of the cases (499) were presented in the paroxysmal stage; that the greatest benefit occurred in the paroxysmal stage, and especially in the younger cases; that early diagnosis could be established bacteriologically and by blood examination as the disease was accompanied by an absolute and relative lymphocytosis in eighty per cent of cases during catarrhal stage, and that suitable vaccines made from organisms with an agglutination titre of 1-1660 plus were effective prophylactically and if given in sufficiently large and frequent doses were of value therapeutically—suggesting that the immunization was quantitative.

The author believed that these observations suggested that by early diagnosis adequate quarantine for the actual infective period could be required with a concomitant decrease in the morbidity and mortality.

A Method for Eliminating the Etiological Organisms in Treating and Preventing Endocarditis in Children.—Dr. Myer Solis-Colen, of Philadelphia, said that endocarditis was caused, as a rule, by microorganisms or their toxins. Except in rare instances, these organisms were not eliminated by the removal of infected tissue or by the washing of an infected mucous membrane with an antiseptic or other solution or by the administration of drugs, important as these measures were. Vaccine prepared from all the organisms or from the predominating organisms present in an infected focus might fail to contain the etiological organism or might contain it in too small numbers, and hence be impotent in raising the patient's bactericidal power against it. In the pathogen selective method of culture only the organisms that were pathogenic for the individual patient grew up. Administration of a vaccine made from them destroyed their pathogenicity and infectivity for the patient both at the focus and in the endocardium.

Static Type of Peritonitis in the Athreptic Infant.—Dr. John A. Foote, of Washington, D. C., said that athrepsia or atrophy as shown by Marriott and Perkins displayed a wasting of the blood in its formed and unformed constituence, as well as alteration in its physical volume and flow. It had long been recognized that athreptic infants were very susceptible to infection, but not so well recognized that symptoms in such infections were not at all typical. Denzer's observations called attention to the frequent presence of pus in the aspirated peritoneal fluid of wasted infants, and surgeons, such as Downs, had noted the absence of clinical symptoms in infants where autopsy findings revealed peritonitis. Children who had passed infancy and who were weakened by intercurrent conditions reacted in much the same way as the athreptic infant.

Analysis of cases of intussusception collected by Hess, Hemmeter, Dunbar and others, showed differences in the symptoms of pain, vomiting, tumor and other dynamic manifestations. Study of the protocols of these cases showed that these symptoms were absent only in the weak, depleted and malnourished children.

Infections within the first month of life were not infrequently accompanied by static peritonitis. Reports of cases from Children's Hospital, Washington, D. C., included an appendiceal abscess in a three weeks' old infant reported by Dr. Charles Crawford, and several athreptic infants with static peritonitis from my own service in which typical clinical symptoms were absent.

The intraperitoneal injection of normal salt solution and its effect on body weight in static peritonitis had diagnostic value, the author said.

A case of static peritonitis in a six months' old boy, accompanied by intussusception with corroborative

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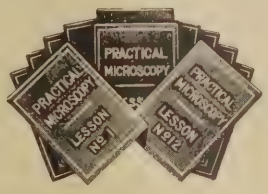

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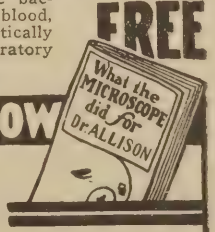

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autopsy findings, showed that even such a typical disease as intussusception might be masked in severe prostration from intercurrent ailments. The use of pituitrin in intestinal atony in infants had a rôle in the production of nontypical intussusception. The author reported such a case with autopsy findings. The greater susceptibility of athreptic infants to infection and the occult nature of the symptoms manifested by such infants, especially in peritoneal infections, made the treatment largely prophylactic. The necessity for human milk and good hygiene in all extreme cases of malnutrition was evident.

PROCEEDINGS OF THE HOUSE OF DELEGATES

The House of Delegates met on Monday morning, May 25th, in the Hotel Traymore, and was called to order by the speaker, Dr. F. C. Warnshuis, of Grand Rapids, Mich.

Report of Secretary.—Dr. Olin West, of Chicago, presented his report as secretary, stating that the membership of the association, as enrolled on April 1, 1925, was 90,646, an increase for the year of 590.

Annual Conference of Secretaries of Constituent State Associations.—The annual conference of secretaries of constituent state associations was held in Chicago in November, 1924. Thirty-seven secretaries were in attendance. The editors of thirteen state journals were also present. There was, possibly, more of frank and helpful criticism, more of constructive suggestion, more of specific proposal for the adoption of definite programs of work than at any previous conference.

Change in Constitution and By-Laws.—The Committee on Reapportionment of Delegates at the Chicago Session recommended that the Constitution and By-Laws should be so amended as to provide for a possible increase in the number of delegates to be elected by constituent state medical associations; and that the regular triennial apportionment in 1924 should be made on the basis of one delegate for each 950 members or fraction thereof. These recommendations were approved by the House.

Official Visits to State and County Societies.—Whenever possible, in response to invitations, officers of the association have attended meetings of state associations and county societies. As a result of these official visits information has been brought back to the association's headquarters which has, in all instances, been acted upon in a manner that has been intended to serve to the advantage of the general membership.

REPORT OF THE BOARD OF TRUSTEES

Death of Dr. W. T. Williamson.—Dr. Walter T. Williamson, chairman of the Board of Trustees, died at his home in Portland, Ore., March 2, 1925. The Board of Trustees will, at a later time, present formal resolutions on the death of Dr. Williamson.

Retirement of Dr. Simmons.—Dr. George H. Simmons, having completed more than twenty-five years of honorable and distinguished service as editor and general manager of the association, retired from active duty, September 22, 1924, after presenting a characteristically thorough accounting of his stewardship. Dr. Simmons, in accordance with action taken by the House of Delegates, is now editor and general manager emeritus.

On November 22, 1924, after election by the Board of Trustees, Dr. Olin West assumed the duties of general manager. Dr. Morris Fishbein, by action of the board, became editor, and Mr. Will C. Braun business manager.

Exhibits.—Important work in the dissemination of public health information can be done through exhibits installed at the meetings of scientific and lay organizations, at expositions and at other places where the public is reached in great numbers. It is intended that the bureau shall accumulate material of this kind as speedily as its facilities will permit.

Exhibits of pamphlets, posters and charts from this bureau, the Council on Medical Education and Hospitals, and the Bureau of Investigation were made during the year as follows: At the annual meeting of the Superintendents' Section of the National Education Association in Chicago; at the National Congress of Parent-Teachers' Association in St. Paul; at the Minneapolis Health Exhibit in Minneapolis; at the annual session of the American medical Association in Chicago; at the annual meeting of the American Hospital Association in Buffalo, and at the annual meeting of the American Dental Association in Dallas. Material has been provided also for exhibits under the auspices of other organizations.

Radio Broadcasting.—Broadcasting of readings from *Hygeia* was continued monthly during the year from Station KYW, Chicago. Arrangements have been made through the secretaries of county medical societies in eight of the largest cities for similar broadcasting through radio stations in these cities.

Federal Income Tax.—Efforts were made to obtain relief through the Revenue Act of 1924 from the ruling of the Commissioner of Internal Revenue denying the professional character of traveling expenses incurred in attending meetings of medical organizations and of the expenses of graduate study. They were unsuccessful. Pending amendatory legislation, redress lies only through the Board of Tax Appeals and the courts. Unfortunately, however, most of the physicians who occasionally complain to the association of the injustice of the Commissioner's ruling have been unwilling to become parties to test cases to try out the issue, and an appeal cannot be taken in a hypothetic case.

Bureau of Investigation.—The interest of the medical profession and of the public in the work of the Bureau of Investigation (Propaganda Department) continues to increase. There was a small decrease in the number of letters received by the bureau from physicians during 1924, but on the other hand more letters were received from laymen during the year than ever before in the history of the organization; in fact, the inquiries received from laymen and from physicians were almost equal in number.

It will be noted that the name Propaganda Department has been superseded by the more descriptive term Bureau of Investigation. This change was made because it was felt that the new name more accurately described the activities of that department of the association's work.

Which Hypnotic?

Many Hypnotics—

Which To Use?

Which is the Best?

But how about a substitute for morphine when Pain causes Sleeplessness?

Is there a drug which is effective?

Has it been proven? Are there clinical data available?

Try ALLONAL and compare its value with that of other hypnotics—

IN the effort to provide a non-narcotic substitute for morphine many hypnotics have been evolved and are offered to the profession.

Certainly a serious question because of the many claims advanced by manufacturers.

Easily determined—the one proving the most useful in therapeutic range, most rapid in action, because quick action is invariably desired —and the safest in ratio to its hypnotic power.

Experience has proved the well known hypnotics usually ineffective in normal therapeutic doses where pain is a factor, because their function is limited almost entirely to inducing sleep.

Allonal was scientifically built for the purpose. It was not a chance discovery. It acts well not only in cases of simple insomnia but also in cases of the severest pain. In medical literature there is no other drug so extensively reported that is non-narcotic and yet resembles morphine so closely in hypnotic and analgetic properties.

Allonal was fully proven pharmacologically and clinically before it was offered to the profession. Published reports from many fields of medicine fully substantiate all the claims made for it.

Not only in the simple insomnias but also in the most difficult cases of pain or psychosis. Compare its action with that of any hypnotic. Prove for yourself the value of Allonal.

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Council on Pharmacy and Chemistry.—The work of the Council on Pharmacy and Chemistry has been prosecuted along the lines that have been followed in previous years. Practically all the large producers of pharmaceuticals now find it possible and desirable to recognize the work of this council.

The Chemical Laboratory.—The Chemical Laboratory having been installed in permanent quarters in the new building, was able to work to much greater advantage during the latter part of 1924 than during the period when building operations were in progress. During the past year, the laboratory has elaborated for the Council on Pharmacy and Chemistry standards for practically all synthetic products submitted. It has questioned the chemical constitution of other synthetics, and manufacturers have been benefited by suggestions emanating from the laboratory, with the result that some of the newer products have been improved. An investigation of the various bismuth compounds used in syphilis is now nearly complete. Standards for chaulmoogra oil have also been worked out.

The Library.—The work done in the library of the association is much greater in amount and in scope than is generally realized. It is essentially a reference storehouse of current medical literature. The number of books on its shelves is not large, but more than 250 of the leading medical journals of the world are in file. More than twelve hundred inquiries were answered last year, not taking into consideration those which came by telephone or those submitted by the personnel in the association offices. In addition to a relatively large increase in bibliographic work, there has been a marked increase in the lending of periodicals, as the result, in part, of the extension of the library service to include domestic journals. In 1923, 475 journals, and in 1924, 760 were lent to physicians.

Therapeutic Research Committee.—The activities of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry are expended mainly along the following lines:

1. The Organization of Therapeutic Research Requiring Collaboration: Work in this field is illustrated by the recent report of the Special Committee on the Toxic Effects Following the Use of Local Anesthetics. A Committee for the Study of Intravenous Therapy has been organized, with Dr. Cary Eggleston as chairman.

2. Support of Investigations of Problems of Special Interest to the Council: Work of this type is supported by the Therapeutic Research Committee when competent investigators may be secured, but almost inevitably much of it gravitates to the laboratories of those who are most interested in the topics proposed; thus, a considerable proportion of such work is performed under the immediate direction of the Chairman of the Therapeutic Research Committee. The grants that are made in this connection cover only a small part of the cost of the investigations, and go to pay for materials and apparatus required.

3. Support of Problems Submitted Independently: This has taken the form of contributions toward the material expenses of investigations that were somewhat beyond the ordinary budgets of the laboratories of the investigators.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The subjects dealt with in the foregoing repo may be thus summarized:

Medical Education.—1. In 1900, there wer 160 medical schools in the United States—mo than half the world's supply—including every var ety, from an openly conducted diploma mill up t the two or three which in standards and equipme compared favorably with any in the world. Mo of them were proprietary affairs conducted f profit. In many only a number of didactic, u graded lectures were given alike to the three four classes. The faculties of thirty or more we made up of from one to five practitioner teacher Many were entirely lacking, or seriously so in eith laboratories, dispensaries or hospitals, and in all b about thirty the entrance requirements were abse or nominal.

2. Now there is a smaller but more normal su ply of institutions, which in every way are well o ganized and efficient medical schools. Seventy-fiv or ninety-three and seven tenths per cent., have e trance qualifications similar to those of the rest the world; sixty three (seventy-eight and seve tenths per cent.) are integral parts of high grad reputable universities; sixty-two, or ninety-five p cent., of the four year colleges either have their ow teaching hospitals (thirty-four) or have liber privileges in other hospitals (twenty-eight) whereb efficient routine methods of clinical instruction a being given, and thirty (thirty-eight per cent.) no have groups of modern college and hospital building making them comparable with the best equipp medical schools of the world.

3. The higher entrance requirements, the co tent of the medical curriculum and the duration the medical course are not excessive, but represent tardiness on the part of this country in the adoptio of standards in our medical schools, long since re quired by the medical schools in Europe.

4. As a result of these great changes, the expens of maintaining medical schools has indeed great increased; and although students' fees have also bee increased, they cover less than one fourth of this.

5. New problems that have arisen as a result these great changes are: A complete reorganizatio of the curriculum; a development of more efficie methods of instructions; provision for a wider ele tion of subjects by the student, and the establis ing of a larger number of scholarships for the assis ance of deserving students without adequate finance These problems have been the main topics of di cussion at medical conferences during the last se eral years. Two years ago, also, a special commi sion was created to make an exhaustive study the pressing needs in medical education.

6. With the tremendous changes in social cond tions, due to the amazing developments in a score more of utiliarian and scientific fields and the great increased facilities for rapid transit between cit and country, there has come about an unprecedente trend of all classes of people away from rural t urban communities. These changes call for exte sive changes, also, in the methods of providing f public necessities in both city and country, includin the benefits of modern medical service.

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Hospital Service.—7. The tremendous growth in the number of hospitals, the great improvement of hospital service, and the trend toward making hospitals accessible to all reputable physicians in their communities seem to offer a solution for the more serious problems of medical practice. The building of more of them in the outlying districts will help to secure a better distribution of physicians, and the development of their educational function will help provide graduate education or the physicians in their communities.

Graduate Medical Education.—8. Up to nine years ago, graduate instruction was given in institutions which, with a few exceptions, offered merely accumulations of ungraded and insufficiently described "courses" of doubtful value to the physician. Now there is a list of fifty institutions giving opportunities for graduate work, which, after careful investigation, have been found worthy of approval. 9. Instead of having to make a wild guess with regard to certain postgraduate courses which might or might not provide him with the instruction desired, the physician now has the information by which he is enabled to select promptly courses that will fit his particular needs.

Advertising of Graduate Schools.—10. Since the list of approved institutions was prepared, advertisements of graduate schools or courses which are not approved have been refused insertion in THE JOURNAL.

12. Graduate medical education can be placed within the reach of physicians of all communities, if the hospitals in those communities properly exercise their educational function.

Great Advances in Medical Education.—13. The tremendous increase in the amount of definite knowledge regarding the specific causes, methods of diagnosis, prevention and cure of diseases, in the last fifty years has been no less marvelous, although possibly less spectacular, than the development of the movies, the automobile, the aeroplane, the radio and other marvelous improvements in astronomy, physics and chemistry.

14. So rapid, indeed, have been the developments in all fields of human endeavor as to require not only a constant vigilance to keep informed regarding them, but also the devising of new methods whereby the essential needs of the public, both individually and collectively, can be supplied. Medical education and practice constitute only a part, although an important part, of the larger general problem.

THE EXHIBITS

The Hugh T. Young examining, operating, and radiographic table was shown by the Liebel-Flashein Company.

The Victor X Ray Corporation devoted their display mainly to showing the uses of their appliances in röntgenology and physiotherapy.

Mead Johnson and Company also demonstrated the many aids a physician could derive from their products. Mead's precision scales and their Mead service should prove of real worth.

Nystrom and Company, of Chicago, showed an excellent series of anatomical charts arranged conveniently for teaching or demonstration purposes.

An extremely interesting deep therapy diathermy lamp was displayed by H. G. Fisher and Company.

The Wappler Electric Company had a generous display of what seemed to be an extremely practical line of cystoscopic and urological material.

The Hoffman-LaRoche Works went to some trouble explaining the mode of manufacture and the uses of their many excellent products.

W. B. Saunders had included in their exhibit the deservedly popular Abt's *Pediatrics* and Bickham's complete *Operative Surgery*.

The Lederle Antitoxin Laboratories demonstrated the pollen diagnostic test for hay fever.

The Patterson Screen Company demonstrated a fluoroscope for finding foreign bodies in ordinarily difficult places.

New urological instruments were shown at the Bard exhibit.

The much discussed improved radio knife used by Wyeth and Kelly was shown by the Acme International X Ray Company.

The new portable electrical stethoscope perfected by the Western Electric Company was the centre of much attention.

William H. Horn showed various appliances useful in orthopedic and general surgery.

The Postum Cereal Company generously served its guests with samples of its various food products.

The Betz Company had an exhibit of equipment, furniture and instruments.

Lea & Febiger had a Chinese translation of *Gray's Anatomy* at their booth. It has not been widely read in this country.

Cushing's *Life of Osler* should prove popular. The Oxford University Press showed advance copies.

Horlick's Malted Milk Company have a new combination of Horlick's milk and barium sulphate for x ray diagnosis.

Metz stressed the various salvarsan products.

Carl Zeiss had an elaborate display of various types of microscopes and instruments for examining and treating divers parts of the body.

A new blood pressure device was demonstrated by the W. A. Baum Company, Inc.

The Winthrop Chemical Company featured some well known products, including veronal, luminal, and protargol.

The Merrell-Soule Company dispensed their fluid Klim to the thirsty, and their tasty Klim wafers to the hungry.

The Flanders-Day Company of Boston had ligatures for every possible need.

The Macmillan Company had an excellent assortment of standard textbooks.

Paul B. Hoeber showed in addition to his own publications and periodicals, an interesting set of historical volumes which attracted much attention. He also demonstrated the Bray film apparatus which is a convenient way of throwing photographs of anatomical and microscopical material on a screen.

E. Leity had a fascinating assortment of precision instruments, including those for photomicrography, blood counting, blood transfusion, and the estimation of sugar in the blood.

William Wood and Company had a most attractive exhibit of their well known and reliable medical books.

The Taylor Instrument Company showed the physician how to take care of his laboratory materials in an efficient fashion.

The National Dairy Council told of proper diet in the making of healthy persons.

The Maltine Company insisted on the profession knowing exactly what their various products contained.

Spencer supportive corsets made by Berger Brothers showed a large variety of their products.

Anesthetics manufactured by the Ohio Chemical Company are pure. They showed the reason why.

Bausch and Lomb featured their new capillary microscope, an excellent and convenient instrument.

Hynson, Westcott and Dunning demonstrated mercurochrome—220 soluble.

The Eastman Kodak Company showed some points of value in the use of the x ray and other films.

Mellins Food told of the uses and values of their products.

A new device, the Cambridge Recording Ophthalmoscope, should prove of immense value. It is based on the design made by Wertheim Solomonson of Amsterdam. A photograph of the retina is made without any alteration in the pupil. This should prove of great worth in brain tumors and in many other branches of research. The product is made in England, the New York works being at Ossining.

Practical Therapeutics

METALLIC POISONING FROM MERCURY, BISMUTH, ARSENIC, LEAD, COPPER, AND ZINC

ROBERT EMMET JAMESON, M.D.
Davenport, Iowa

Dermatologists, syphilologists, first aid physicians and industrial surgeons meet with cases of poisoning from the various metals named above, therefore all physicians should be familiar with the symptoms of these metallic poisons. The dermatologists, syphilologists and industrial surgeons especially should familiarize themselves with the symptoms of metallic poisoning and should learn the method of treating these cases, which was first worked out by French physicians and now in general use.

McBride and Dennie, of Kansas City, in an article published in 1923 (1) gave their experiences with sodium thiosulphate and the method of using it. Fournier some years ago pointed out that patients who were taking mercury while under treatment for syphilis, sometimes presented severe symptoms of metallic mercury poisoning, even when all the usual precautions of mouth hygiene had been attended to. Other patients may complain of itching and the more severe symptoms of arsenic rash which may even become alarming if the symptoms are not recognized and the drug discontinued and prompt treatment administered.

Formerly about all we could do was to stop the drug or keep the patient from coming in contact with the offending metals causing the untoward symptoms. Today, if we see a patient with salivation or the more severe symptoms of mercuric poisoning the drug is stopped and all acids are withheld from the diet and sodium thiosulphate administered either intravenously or by mouth or both. In cases of bichloride poisoning where the drug has been taken by mouth we should at once wash out the stomach with clear water until the poison is entirely washed fro mthe stomach, then fifteen gm. of sodium thiosulphate in 480 c. c. of water are administered through a stomach tube and allowed to remain in the stomach. The stomach tube is then withdrawn and immediately 0.3 gms. of sodium thiosulphate in ten c. c. distilled water are administered intravenously. For the following nine days the following doses of sodium thiosulphate are given intravenously: second day 0.45 gms. in ten c. c. of water, third day 0.6, fourth day 0.9 gms. in twenty c. c. of water, fifth day 1.2 gms. in twenty c. c. of water, on the sixth, seventh, eighth, ninth and tenth day 1.8 gms. in twenty c. c. of water. If the powdered form of sodium thiosulphate is used, the distilled water is put up in ampules ready for hypodermic use.

McBride, Dennie and others have obtained some splendid results in the treatment of metallic poisoning with this method.

I believe that every police station, all first aid stations, department stores, factories, hotels and railway depots should have sodium thiosulphate in ampules of assorted sizes in their first aid kits for immediate hypodermic use and in powdered form with proper doses, labeled so that it can be mixed with water for lavaging the stomach. City and county physicians and contract surgeons should know of the uses of sodium thiosulphate. In this way many lives may be saved.

When we consider the many hundreds who are daily exposed in the various trades to lead, copper and zinc and the hundreds of patients who are having either mercury or bismuth and the various arsenicals administered for the treatment of syphilitic infections we realize the importance of prompt and effective treatment. In the past we have not had any method of treatment to equal sodium thiosulphate. The redness, edema, serous exudate seen in salvarsan rashes and exfoliative dermatitis disappear and the dry desquamating stage is reached on the fourth to tenth day and the entire course of the condition is shortened from three to six months to as many weeks. In bichloride of mercury poisoning even more marked and prompt results are obtained with sodium thiosulphate. The abdominal pain, bloody stools, albuminous urine and even unconsciousness are relieved by the first dose of sodium thiosulphate, and after the fourth dose the patient is practically well.

REFERENCE

1. McBRIDE and DENNIE: *Archives of Dermatology and Syphilology*, January, 1923.

New Treatment of Impotence.—Lissmann (*Wiener klinische Wochenschrift*, June 26, 1924) classifies impotence into three groups: psychic, neurasthenic and those cases with no discoverable organic or psychic etiology. Psychic impotence requires psychotherapy plus the other usual methods of treatment, but the chief aim should be to convince the patient of his curability. The neurasthenic type of impotence must be treated along the lines of the neurasthenia, including the entire gamut of tonics, climatotherapy, balneology and gymnastics, psychoanalysis, possibly a change of occupation; treatment of the genital symptoms must be avoided most of all. In the third group the existence of any and all pathology must be excluded. The psychophysical sexual mechanism must be put absolutely at rest for several weeks and lukewarm brine baths, gymnastics, and a pelvic girdle should be advised. The list of aphrodisiacs is very long. Yohimbin produces marked congestion of the genitals, a diminution of blood pressure, an increase in tactile and genital sensitiveness and vasodilatation of the renal and dermal bloodvessels. It increases the reflex excitability of the sacral portion of the cord and the congestion of the genitals. This action of yohimbin may be accelerated by epidural injection combined with twenty c.c. of physiological saline solution. These injections may be given in the physician's office. An additional aid is a few applications of galvanization of the lumbar and sacral portions of the cord, with the anode above and the cathode below with a current up to four milliamperes.

Treatment of Mumps.—F. H. Thompson (*Clinical Journal,* August 27, 1924) says that the patient must be kept in bed, his bowels should be open daily, he should be blanket bathed daily and his mouth kept clean. The diet at first should be fluid, but as soon as the patient is able to chew he may be allowed fish, bread and butter, etc., to be shortly followed by ordinary food. No application to the parotid is necessary, but pain may be lessened by hot applications, though some sufferers find more relief from cold.

The tendency to orchitis is much increased if the patient is allowed to get up too soon, and he should not be allowed up until at least three or four days have elapsed since the complete disappearance of the swelling, for orchitis may lead to sterility. Should orchitis occur, the part requires support and protection and hot or cold applications. It is said that incision may prevent atrophy, and the operation is as follows: A two inch incision is made vertically in the tunica vaginalis, the organ brought out, and a dozen incisions, not over a quarter of an inch long, are made just through the tunica albuginea parallel to the long axis of the testis. If necessary the epididymis should be similarly treated. A drainage tube is then left in the tunica vaginalis and the wound closed round it, the scrotum being firmly bandaged.

Effects of the Intravenous Injections of Acriflavine.—Harvey Spencer (*Journal of Laboratory and Clinical Medicine,* February, 1924) states as the result of an investigation to determine the effect of acriflavine upon red and white cells, and the bactericidal action to be expected from the intravenous injection of the compound, that in a concentration of 1 to 2,000 or lower in physiological saline solution, it has no agglutinative action upon human erythrocytes. *In vitro,* acriflavine in concentrations greater than 1 to 8,000 in saline is lytic for human erythrocytes. *In vivo,* acriflavine injections to the amount of 0.1 gram to the kilogram of body weight (rabbit) induces a slight but transitory reduction in the number of the red cells, and a considerable increase in the number of the white cells. A single intravenous injection, or multiple injections, of the tolerated dose does not lead to an increase in the bactericidal action of the serum when tested against Staphylococcus aureus. White mice injected simultaneously with the tolerated dose of acriflavine and the minimal lethal dose of virulent pneumococci are not protected by the dyestuff.

The Value of Alkali in Dye Therapy.—Victor Burke and Irene Grieve (*American Journal of the Medical Sciences,* July, 1924) say that the bacteriostatic and bactericidal action of many of the dyes varies with the hydrogen ion concentration of the medium surrounding the organisms. With an increase in alkalinity there is, with but few exceptions, an increase in the action of the dyes for gram positive and gram negative bacteria. The fluids of the body may vary in their hydrogen ion concentration, causing the bactericidal action of the dye to vary greatly. The body fluids should be made alkaline by the administration of sodium bicarbonate, or the application of an alkaline wash before the dye is applied. Lactic acid, which is usually present in pus, reduces the action of the dyes. The bacteriotropic action of the following dyes can be increased by the use of alkali: Crystal violet, methyl violet, gentian violet, brilliant green, basic fuchsin, the flavines, and malachite green. The action of many other dyes of less importance is affected in the same way. The use of alkali will, in certain types of infection, prove beneficial in addition to the effect on the antiseptic power of the dyes. Controlling the hydrogen ion concentration of the body fluids may be utilized to check the growth of certain bacteria. Many of the factors in resistance and repair are more active in an alkaline medium.

Relief of Visceral Pains with Paravertebral Injection.—F. Brunn and F. Mandl (*Wiener klinische Wochenschrift,* May 22, 1924) report good results with the use of paravertebral injections of ten to fifteen c. c. of a 0.5 per cent. solution of novocaine without the addition of adrenalin in gallbladder and renal colics. Several patients with angina pectoris were also relieved for several months, some for only days. The injections must be made very carefully to avoid the spinal canal and the pleura. A needle ten cm. long is inserted three cm. from the midline and then turned slightly to the side to avoid injecting the rami communicantes. Renal colics require the injection to be made in the right thoracic segment. For angina pectoris the injections are made in the first to fourth dorsal segments and in paroxysmal tachycardia in the first and second dorsal segments. Injections should be made for angina pectoris only when all other therapeutic measures have failed. Paravertebral injection is a harmless and simple procedure.

Effect of Röntgen Rays upon Blood and Agglutinin Formation.—The following results were obtained by Carl Frei and Albert Alder (*Schweizerische medizinische Wochenschrift,* July 24, 1924) in the study of the effects of röntgen irradiation with large and small doses upon agglutinin formation in the guineapig:

1. Röntgen rays do not affect previously existing agglutinins.

2. In animals injured by röntgen rays the formation of agglutinins proceeds undisturbed, both with the lowest leucocyte counts and in the presence of severe injury of the blood system.

3. With simultaneous irradiation and immunization the irradiation appears to activate the formation of agglutinins, inasmuch as it occurs earlier and is more pronounced than in the immunization controls. In no case was an unfavorable effect observed.

4. The site of agglutinin formation is probably not the same as that of the blood elements, inasmuch as the formation of agglutinins proceeds undisturbed in spite of the most severe injury of the blood elements.

5. The blood changes seen after irradiation were the following: The intensity of the blood injury depends upon the duration of the irradiation. The lymphatic system reacts rapidly to the irradiation, the myeloid system more slowly and the erythropoietic system still more slowly. The rapidly developing diminution of the leucocytes probably depends upon a more rapid destruction of the circulating elements.

Historical Medicine

A Brief Synopsis of the History of Venereal Diseases

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The science of medicine is incompatible with suppositions. An idea to be accepted must be accompanied by ample proof of undeniable facts. It must be verified by microscopical findings, laboratory tests, röntgen ray photographs, Koch's postulate, at the autopsy table, or biological tests. But there are certain ideas, created in the investigating mind, to which the above named verifying agents are not applicable. What, then, should the man of those ideas do? Shall he, therefore, abandon his ambition, abolish his thoughts, and put a lock on his reasoning power?

The human mind resorts, then, to old documents, studies the ideas of his ancestors, and demands explanation even from skeletons that were buried thousands and thousands of years before. The questions we are about to discuss are three in one; that is, three questions, which were considered as one, until about a century ago. When was the Treponema pallida born? How old is the gonococcus? In what era did the Ducrey bacillus pay us its first visit?

These questions have given rise to controversy in the profession and no absolute conclusion has been reached so far.

Bloch in *The System of Syphilis,* Volume I, 1908, insists that there is no evidence of syphilis in the Eastern hemisphere previous to the return of Columbus with his sailors from Hayti about the end of the fifteenth century.

It is asserted by many physicians of Europe, that these sailors brought the disease from America and infected the inhabitants of Barcelona. In 1493 it reached Italy by the soldiers of Charles the Eighth, who besieged Naples with the intention of civilizing it and succeeded in syphilizing it. On the other hand, there are many other physicians and reliable investigators, among them such great authorities as Dupuy and Duchesne, who state that the venereal diseases existed long before that time, and that no evidence is not always compatible with no existence.

As it is not the intention of this paper to enter into the discussion, nor is it possible to do so within limited space and time, I will proceed to trace venereal diseases from their remote antiquity up to the present time.

J. Parrot, late professor of the faculty of medicine in Paris, asserts the existence of venereal diseases as far back as the Stone Age. This assertion is based on excavations, which were made in Solutre, in the region of Seine-et-Loire. It is a site definitely proven to be prehistoric from the findings of reindeer, horses, cut flints and remains belonging to the Gallo-Roman Merovingian epoch. In 1872 Abbe Ducrost found a female skeleton, which was examined by famous anthropologists, such as Broca, Parrot, and others. It was their opinion that this skeleton could be referred to the Stone Age. The two tibiæ of this woman presented exostoses along their entire length. After careful examination, Broca, Allier, Parrot, and Virchow pronounced it syphilitic. Another valuable proof of the existence of syphilis nearly five thousand years ago, can be obtained from the following fact. At a period, which equals the year of 2637 B. C., the Emperor of China, Hoang-ty, ordered for the benefit of his people, that all the medical documents should be collected and compiled in the form of books.

In 1863, Captain Darby, by the help of some native friends, translated these manuscripts. A full description of symptoms corresponding to the disease of syphilis was found in them; also a statement that mercury is the specific treatment for this disease.

It is worth while remarking, that the sons of Noah and their descendants, our ancestors, were at that time nothing but horrible anthropophagi.

There is no direct evidence of the existence of syphilis in ancient Egypt at the time of the Pharaohs 1400 B. C.

Almost all the hieroglyphic tablets, that were found and deciphered, deal with ordinary every-day occurrences. Nevertheless, the *Ebers Papyrus,* printed by Ebers in Leipzig in 1875, treats of medicine at the time of Rameses the Second. The translation was made by Chabas, a native, and it contains certain descriptions corresponding to the symptoms of constitutional syphilis. Definitely expressive and explicit on the subject of venereal diseases is the Bible. It indicates that gonorrhea and syphilis were frequent guests in the camps of the sons of Jacob. It also shows that the lawgiver, Moses, knew the malignancy of syphilis and its contagious powers. When his teaching of precaution was forgotten, his methods of prophylaxis not followed, and an epidemy of syphilis broke out, he adopted the most radical treatment that was practical under the circumstances, in order to save the whole community from becoming a prey to the disease, as we shall presently see.

The symptoms of the different forms of skin eruptions described in Chapter 13, of Leviticus, correspond to leprosy as well as to syphilis. It is extremely possible that the word "leprosy" employed in the Bible is rather a generic term covering various forms of skin disorders.

Chapter 15, Leviticus, considers the two varieties of urethral discharges. The first variety is the specific one. Not only direct contact with the individual is strongly forbidden, even to touch anything that came in contact with the sick one, produces an uncleanliness, which requires a thorough washing of one's body and clothes. The sufferer himself is unclean until seven days after the discharge completely ceases. He, then, washes himself and his clothes in running water and becomes clean.

The second variety is treating an ordinary sperma-

torrhea and requires from the afflicted nothing more than a good wash of his body and be unclean until evening.

Chapter 25 (v.1) Numbers: "And Israel abode in Shittim; and the people began to commit incest with the daughters of Moäb."

v. 3. "And Israel joined themselves unto Baäl Peör." This was the god of prostitution of Moäb. Almost every Asiatic country practised the socalled religious prostitution. The priests of those temples were always sure to have a full house. There was no necessity for special attraction to draw a crowd. The children of Israel, who had recently heard the seventh commandment "Thou shalt not commit adultery" thundered down from the smoking Mount Sinai, could not resist the temptation of Baäl Peör. What was the result?

Says the Bible: "Then the wrath of Jehovah made itself felt." Soon after an epidemic disease broke out and decimated the Israelites. Twenty-four thousand men became infected, and in order to stop the spread of the disease to all the camps, Moses was compelled to kill all the infected men.

In the description of the vengeance of Israel on the Midionites, Chapter 31, Numbers, where it is related that the Hebrews took the women captive, Moses reproaches them, saying:

"Are these not the women who have seduced the sons of Israel at the instigation of Bil'am, and who have made ye deny the Lord, your God, to make you sacrifice to Peor, from whom has come the scourge, which has stricken our people?" And an order was given to kill all the women who have known man. These words need no commentary. They speak for themselves and show us the character of that epidemic.

Chapter 28, v. 27. Deuteronomy: "The Lord will visit thee with the ulcers of Egypt, and with the hemorrhoids, and with the scab, and with the itch, whereof thou shalt not be able to be healed."

v. 35. "The Lord will cover thee with bad ulcers from the sole of thy foot to the top of thy head, upon the knees, on the legs, and thou willst not get well."

v. 59. "Thy sores will increase by the will of God, as also those thou hast given to thy progeny; then they will be large and persevering sores, the worst and most lasting lesions."

Note in this verse the indication for hereditary syphilis.

Proverbs, Chapter 6 and 7, mentions the dangers of syphilis caused by having intercourse with a prostitute.

Isaiah (785 B. C.), Chapter 3, v. 9. "The boldness of their face testifieth against them, and like Sodom they tell openly their sin, they conceal it not. Woe unto their soul, for they have prepared evil unto themselves."

v. 17. "Therefore will the Lord smite with leprosy the crown of the head of the daughters of Zion and the Lord will lay open their nakedness."

Ecclesiastes (2950 A. M.). "Whosoever joineth himself to adulterers shall become impudent and that rottenness and worms shall have him to heritage."

There are many places in the Bible, where this disease is directly or indirectly referred to, but for obvious reason I can not mention all of them.

It is almost impossible to trace venereal diseases among the Hindus (1000 B. C.) or among the Greeks before and after Christ or later among the Romans, without mentioning again the religious prostitution, which was practised by nearly all the ancient nationalities. The gods, which required this sort of worship, were: Lingam, Baäl, Venus, Priapus, Brahma, Vishnu, and Siva.

The last named was the main god in Hindu. One of the books of Vedas, the Hindu Bible, contains the practice of medicine.

Chapter 21 reads as follows:

"Thus the irritated humors produce disease: attacking the abdomen they produce difficulty in urinating. Attacking the penis, they produce functional trouble of that organ, venereal disease, alteration of the semen, and other diseases. If the cellular tissue is attacked, there will be: tubercles, tumors, painless swelling, cervical ganglia, and so forth."

This text reads like: gonorrhea, cystits, fistula, tumors at the anus, orchitis, gonorrheal, tuberculous or syphilitic epididymitis, gummata of the skin, indolent ganglia at the neck, etc. Note especially that the text separates gonorrhea from venereal disease and considers the discharge an alterated semen.

We are now approaching to examine the Greek medical works on venereal conditions. Surprising enough, the great Hippocrates, the father of medicine as he is usually called, who practised at the city of Cos (460 B. C.) does not speak directly of syphilis. All we find in Lecture 3, Section 21, of his book is the following:

"*In summer occur . . . Opthalmias,* pains in the ears, ulcerations of the mouth and rotting of the genitals."

Section 14. "Under the influence of Southern Winds there come moist ulcers, especially in the mouth and upon genitals."

This meager and deficient description from such a celebrated physicain has given a triumph to the opposers of the idea, that syphilis existed in those days. Astruc, especially, uses this fact in his argument.

Says the other side:

If lead poison was to be to him only colic; malaria, only intermittent fever; so it is possible that syphilis is only ulceration of the genitalia.

Galen of Pergamos (130 A. D.) describes symptoms resembling syphilis. During the Roman dynasty the practice of religious prostitution was continued. The temple of Isis, Venus Volupia, Venus Solacia, and especially the gardens of Priapus were constantly filled with worshippers.

The poets of that time describe in beautiful Latin verses the extraordinary and abnormal indulgence in women. They also portray all the symptoms of syphilis as an inevitable result.

Catullus describes male concubinage practised by young boys at the age of puberty, coaxed into it by their parents. The doctors of those days: Dioscorides, Oribosius, Aëtius, Alexander of Tralles, and Paulus Ægineta have not done any original work in the field of venereal diseases. They have followed their predecessors of the Greek School. The Arabian School completely eclipses that of Greece. Rhazes, a famous physician practising in Bagdad at the end

of the ninth century, describes venereal papules followed by tumors on the vulva or penis as a result of coitus. Ali Abbas at the end of the tenth century, Mesvé, Isaac, Avicenna, Avenzoar, Averroës and Albucasis, all famous physicians of the eleventh century, have described similar symptoms.

Mesvé tells us that the disease which was known as the Persian Fire was nothing but chancres.

Michael Scot (1214-1291) writes:

"When a woman has a discharge, if a man have intercourse with her, he has many opportunities of contracting an affection of bad nature on his penis. In addition it should be known that if conception take place at that time the product will be tainted with the diseases."

Note, that this author plainly indicates heredity of venereal disease.

Guillaume de Salicet, professor of Verona (1270) in his book *Surgery,* Chapter 53, describes crusts and ulcers of the legs as venereal disease. He also advises friction with mercury quenched with saliva. At present we quench the mercury with lard, which is infinitely more practical.

Gulielmus de Saliceto, a physician of Piacenza in 1270 states: A bubo or impostum of the groin arises for the most part from a cold humor, which is expelled from the liver to those places which are weak and empty. It may proceed sometimes from a hot humor and sometimes it comes from a fulness in the yard (*in virga corruptio*) contracted by lying with an unclean woman.

Bernard Gordon, professor of physics in the University of Montpellier (1300) says: "Diseases of the yard are numerous, following lying with a woman, whose womb is unclean, full of putrid sanies, virulence, etc."

Sylvaticus in 1317 says: "If you wish to preserve your organ from a virus, in case you should have reason to suspect your companion of being infected, wash yourself as soon as you retire with cold water to which vinegar has been added or with wine."

Beckett and Wagstaff (1399) state: "Joan de Gaunt mortus est ex talis putrefactione membrorum genitalium et corporis, sui causata per frequentionem mulierum."

Petrus de Argelata, of Bologna (1425) says: "The retention of the poisonous matter lodged between the glands and prepuce, after coitus with a foul woman, causes the part to become black and the yard mortifies."

Before I end the tracing of the Middle Age period, I must mention the fact that in 1495 a great epidemic of venereal disease broke out in Naples and has spread all over Europe. The Spanish physicians were the first to blame America for it. The blame was thrown on the sailors, who have returned with Columbus from Hayti as I have mentioned before.

Previous to the 15th century these diseases received no names. During the epidemic the following names were given: Morbus neopolitanus, morbus gallicus, mal de francois, gore, grande gore, verolle, and grande verolle.

Note, that though they believed that the disease was imported from America, yet they did not name it, Morbus Americanus. Sebastian Brant and Grunspeck named the diseases scorra pestilentialis.

The first one to name them venereal disease was a French doctor by the name of Jacques de Béthencourt, 1527.

Now let us sum up what we have learned so far:

1. Documents indicating the existence of venereal diseases with remote ages.

2. During the thousand years (Middle Ages) syphilis existed in an endemic state.

3. From time to time it disseminated itself, for reasons of debauchery and lack of hygiene, into outbreaks and received different names according to the impression formed at that time.

4. Leprosy was the name given to all skin diseases, syphilitic or nonsyphilitic. All authors of the fifteenth century agreed that the leprosy of those days was communicated by coitus.

5. The use of mercury, which the physicians were forced to accept from the hands of the empirics, constituted the tangible proof of the identity of the leprosy of the Middle Ages with the syphilis of today.

Has the world profited by the terrible epidemic of 1495? Has humanity taken a lesson with reference to hygiene? Have the people improved their manners and checked debauchery? History answers they did not. Morality has been corrupted just the same as before.

Fracastorius (1530) published a poem, in which he described the symptoms of syphilis so wonderfully, that no one of the present time authors can add anything more. He named this poem *Syphilis,* a name which was destined to remain. He had no doubt that the scabies and leprosy described in the Latin poems were all syphilis.

He recommended for treatment infusions of mint, hops, thyme, and guaiac. He also strongly advises sweating. "When one perspires, the rottenness leaves the body with the drops of sweat." These are his own words. He also speaks of purging and bleeding. But above everything he praises mercuric inunctions, which he pushes up to salivation.

In the following years, the mercuric inunctions were practised to such an extent, that the gums of the patients softened and their teeth fell out. The result was, that the patients rebelled against this treatment and the physicians were compelled to abandon this treatment for fright of losing their patients.

Paracelsus (1536) was the first one to proclaim that mercury was the only drug specific for syphilis.

Fernel (1548) corroborated the statement of Paracelsus.

Benoit Textor (1550) was the first to recognize two varieties of chancres. One without ulceration commonly called Apusthumous; the other is ulcerated and excoriated. He considers a chancre incurable and advises extirpation.

Gabriel Fallopius (1555) describes clearly the primary lesion and points out, that the indurated margin of the chancre is a pathognomonic symptom of the disease. He also had recourse to mercurial inunctions. The question: how long may the mercury treatment be pushed, was a matter of dispute through the whole sixteenth century.

The seventeenth century did not produce any new ideas in reference to venereal diseases.

Le Monnier (1689) is still under the impression that gonorrhea is one of the primary symptoms of syphilis. Though he advances a correct idea,

namely: a healthy woman having relations with an infected man, may transmit the virus to one or more, without being herself contaminated by it.

The first writer in the eighteenth century, Jacques Vercelloni attributes the disease to fermentation of the seeds.

Boerhaave, the Dutchman, (1728) states: that gonorrhea rarely occurs in connection with syphilis and, therefore, he thinks, that the symptomatology of syphilis has been markedly modified. To believe him, gonorrhea would even be a sort of vaccination against syphilis.

Dibon, two years later, determined that gonorrhea was never cured by mercury. Today we understand the reason, but the author at that time was greatly astonished at it.

Astruc (1736), physician to Louis the Fifteenth, wrote a celebrated treatise on venereal diseases. He believed in the existence of a virus. He divides the diseases into two stages: local and universal. Under the first, he includes: virulent gonorrhea and consequences, venereal buboes, chancres, verrucæ, and condylomata. Under the second stage he includes: diseases of the genitals, skin, mouth and nose, venereal pain, diseases of the bones, glandular and lymphatic tumors, diseases of the eyes and ears, and disorders of the functions.

We have now arrived to that period, in which, the most famous physician of his time, the enthusiastic experimenter, the celebrated author and teacher, John Hunter of England. He describes fully the initial lesion and establishes the pathognomonity of induration. Like Astruc, he also believes in a virus, and the virus may affect in two modes. Primary or locally and secondary or constitutionally. He has performed a great number of inoculations. Through a laboratory mistake, he inoculated himself with the virus of syphilis, believing it to be that of gonorrhea. When the result was a typical chancre, he proclaimed that gonorrhea and syphilis are caused by the same virus. He makes then the erroneous statement that if the virus comes in contact with mucous membrane the result is gonorrhea and when with skin a chancre would follow.

This error has clogged the wheels of scientific progress for fifty years. It has especially caused a death blow to the idea of Benjamin Bell, who gave reasons for the separation of gonorrhea from syphilis two years before.

Hernandez of Toulon (1810) survived the idea of Bell. He also created the theory of larvated syphilis in both sexes. In the beginning of the 19th century a curious theory has been adopted by some authors. Broussais (1815) denies the existence of a virus as the cause of syphilis and places this disease on the same line with scrofula. Ten years later his pupils Jourdan and Richard follow up the doctrine of their teacher and say: "Call it what you will but name it not virus." They regard the constitutional symptoms of syphilis not as a poison but merely as a sympathetic response to local irritation.

In 1830 we observe the existence of two schools. One school teaches that there are several identical viruses in syphilis. That it may start by chancre, gonorrhea, or bubo. The other school recognizes only one syphilitic virus and rejects certain venereal diseases as nonsyphilitic. The first school is known as Identists, the second, as Unicists.

M. Ricard belongs to the Unicists. We must admit that Ricard has ended the conflict, which reigned in science for fully three hundred years.

His definition of venereal disease is as follows: "All those affections, which are more or less, directly or indirectly, the consequence of sexual intercourse in whatever way affected." He distinguishes the virulent from the nonvirulent attacks. The virulent results in chancre and the nonvirulent, in chancroid.

In 1857 he acknowledges his errors, profits by the discoveries of others, adopts the idea of Bell and Hernandez, that gonorrhea and syphilis are two distinct diseases, and demonstrates the truth of it by a series of inoculations.

He also accepted the theory of the school of Lyons admitting the existence of mixed chancres. His division of syphilis into three stages: primary, secondary, and tertiary is now accepted all over the world.

There is a tendency to divide syphilis into two periods. One, the primary, embracing the period of incubation and morbid determination. The other, consecutive period, embracing the time of virulence and destruction.

The cause of this tendency is to overcome the difficulty, which we meet quite often under the present assumed division; namely; the fact that some secondary symptoms are found in the tertiary stage, and some tertiary symptoms are found in the secondary stage.

On the other hand, there is more difficulty and burdening on the mind of the student to differentiate the resolutive from the destructive period. For, it is plainly to be seen, that, while it is easy to recognize necrosis of the nasal bone or that of the hard palate, it is not so easy to recognize an exostosis or certain late manifestations of cutaneous syphilis.

An attempt has been made in 1852 by Auzias Turenne, followed by Sperino at Turin and Boek at Christiania to form a vaccine against syphilis. The attempt failed and those who have been inoculated have gotten syphilis. They would otherwise probably never have gotten it.

In 1878 the gonococcus was discovered by Neisser and gonorrhea is therefore termed Neisser's disease.

In 1889, Ducrey isolated a bacillus and Unna proved that this bacillus is the cause of chancroid.

In 1903 Metchnikoff and Roux have succeeded in reproducing syphilis by inoculating monkeys.

March 3, 1905, Fritz Schaudinn discovered the Treponema pallida in a syphilitic lesion.

In 1910 Ehrlich announced his famous compound known as 606 or salvarsan, which is at present adopted as the first attempt in the cure of syphilis.

One important result of the discovery of the parasite was the application of the method of serum diagnosis. Upon the fact that by the introduction into the system of parasites, there must follow a production of immune bodies in the blood, the Wassermann reaction is based.

Finally I must mention M. Mauriac (1883) who divides the history of syphilis into four periods:

1. Creative period; from the epidemy to 1508.
2. Dogmatic period; from 1508 up to John Hunter.

3. Experimental period; from Hunter to the nineteenth century.

4. Scientific period; embracing the nineteenth. Let us hope that the historian of the twentieth century will record the name of a great man, who will succeed in finding an immunizing agent against all forms of venereal disease to safeguard humanity.

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The Seguins of New York; Their Careers and Contributions to Science and Education.—Dr. Charles L. Dana, writing in the *Annals of Medical History* for December, 1924, gives a short sketch of the lives of Dr. Edouard and Dr. Edward C. Seguin, with comments on their personalities and the contributions they made to science and education.

Dr. Edward C. Seguin was born in Paris in 1843. He accompanied his father to the United States in 1850, living first in Ohio. In 1863 the family came to New York City, where he graduated in medicine in 1864. He was a surgeon in the army until 1865, from that time until 1867, interne in New York Hospital. He studied in Paris from 1869-70, returning to New York in 1871, where he was associated for five years with Dr. W. H. Draper. He was lecturer in neurology at the College of Physicians and Surgeons from 1871 until 1885. During that time he established a clinic for nervous diseases in the Medical College, the first clinic of the kind established in the country. He was one of the founders of the American Neurological Association and of the New York Neurological Society. "He was one of the first, if not the first, to teach the value of very large doses of iodides and of aconite, hyoscine and nux vomica. . . . He claimed that he was the first to give hypodermics of water for pain." He believed firmly in the fact that neurology is a part of internal medicine, and was the founder of the *Archives of Medicine.*

Although Seguin was not a New Yorker by birth, nor even a college graduate, he very early achieved a position in his profession in the city, and a high rank at the College of Physicians and Surgeons when he was only twenty-eight. Dr. Dana writes that Seguin made a very deep and definite impression upon him, and that he believes he was perhaps the most important and useful factor in the development of neurology at that time. "This was because of his precise and careful methods, of his thoroughly scientific attitude towards clinical medicine, and his sincerity and honesty in connection with his patients and his work. . . . Happily this intense interest in clinical work was not inspired, as is often the case, mainly by a desire to make a diagnosis. Seguin was equally interested in trying to cure and help his patient."

Dr. Edouard Seguin, the father, was born at Clamency, France, January 20, 1812. He was educated at the College of Auxerre and St. Louis, Paris. He studied with Itard and later worked with Esquirol. In 1839 he opened a school for idiots, with a view to educating them, for he believed that often the brain is not diseased or abnormal, but only arrested. This institution, the first of its kind, was officially approved by the Académie des Sciences in 1844. After ten years of work in Paris, the Seguins came to the United States, and to New York several years later, where Dr. Edouard Seguin helped to organize the School for Defectives at Randall's Island. In 1873 he represented the United States at Vienna as commissioner of education in the matter of the organization of asylums for the blind, deaf, idiotic, aged and infirm. He was a prolific writer; his greatest work was his *Treatise of the Moral, Hygienic, and Educational Treatment of Idiots,* published in 1846.

The writer believes that Dr. Seguin was very nearly a genius. "He not only devised a new and successful method of education and treatment of a class previously neglected, but he had the intelligence to work out its practical details, developing and carrying out his system so logically and effectively that it quickly won world wide acceptance." He knew psychology and philosophy, was conversant with literature and the languages, and loved painting and poetry, writing very good verse himself. "He was very modest and retiring personally, very eager always to help others, and most generous and unsparing of self. He seemed always to be searching for ways to help his fellowman."

Surgical Operations in Ancient India.—In addition to minor operations, the Hindoos performed a certain number of major operations, among which was the amputation of limbs. They were acquainted with laparotomy, upheld in the case of intestinal obstruction; abdominal paracentesis in dropsy, vesical section, and even the Cæsarean operation. Intestinal suture in case of lesion of the intestines was accomplished by means of "clamps" of an animal nature: they made large black ants armed with strong mandibles bite the lips of the wound; then they removed their bodies, leaving the heads in place on the wound. The ablation of a cataract was performed through extraction, not couching. Hindoo surgical operations were among the most original and most perfected of antiquity.—(*Æsculape,* February, 1925.)

The Use of Tobacco in Medicine.—The time of the introduction of tobacco into Europe is difficult to place exactly. It is generally attributed to Nicot who presented some in 1560 to the Grand Prieur de Lisbonne and to Catherine de Medici; hence the names, nicotine, herbe du Grand Prieur, and herbe de la Reine. As to its use in medicine, it rose, after Dr. Georges Petit, to Francis II, who covered with ulcers, salved them with an ointment with a base of tobacco, of which Catherine de Medici gave him the formula: Fresh tobacco leaves, ground in a mortar, one pound; melt half a pound of clean pork fat to the consistency of ointment on a slow fire, and strain through linen.—(*Æsculape,* 1925.)

Editorial Articles

CONVENTION IMPRESSIONS

The seventy-sixth annual convention of the American Medical Association was a source of stimulus to the many medical men gathered at Atlantic City. The inspiration of the high level should carry on to the medical profession throughout the country. The various representative groups functioned smoothly. The coordination of the machine as a whole was splendid.

The exhibits were laid out in a most attractive setting on the Steel Pier. The long, double, central isle was flanked on either side by booths containing the latest developments in instruments of the newest design, physical apparatus for every conceivable function, up to a mechanical horse. There were vibrators for every little joint and ligament. There were magic lights for aches and pains. In fact, the apparatus displayed for physiotherapy needs were in keeping with the progress made in this field recently.

Of foods, there were many milk preparations for the infant, diabetic foods, food for gastric disorders, and foods to determine the type of disorder.

X ray and electrotherapy apparatus of many types were given special emphasis, the rays being placed on the new daylight screen.

A new and no doubt extremely practical device for the photography of the retinal image should find favor for the finer diagnostic points about which neurologist and ophthalmologist so frequently differ. A special field for this device should be in the diagnosis of progressive brain tumors.

A new absorbent cotton was shown which has a tremendous power of absorption. This will find favor among surgeons.

The principal progress shown by the exhibits was along mechanical or physical lines. There were no startling or well marked innovations in the field of new drugs. The substantial products were stressed.

The book publishers had attractive exhibits. Saunders, Appleton, Mosby, Macmillan, and Hoeber had prominent displays which attracted a great deal of attention. Hoeber had, in addition to his regular showing, a fair collection of most interesting historical books on medicine.

Among the scientific exhibits was that of Chevalier Jackson showing the menace of lye to children. He seems to have shifted his interest from the aspiration of foreign bodies to that of the treatment and prevention of lye burns, both of vital and everyday importance.

The heart exhibit featuring the work done by Williams at Columbia University was exceedingly well worked out and a fine piece of systematic scientific work.

The syphilitic exhibit, as well as many of the other exhibits, including the moving pictures and the fresh pathological specimens, showed little that was new to the well posted medical man.

On the whole, the exhibits were interesting and worthy of careful inspection.

THE NEW SURGERY

Among the papers of foremost importance presented at Atlantic City was the inspiring, if somewhat sensational, report made by Howard A. Kelly of Baltimore and some of his colleagues on the new surgery.

This work is founded on the principles laid down by George A. Wyeth, of New York. In the main it consists of the substitution of the electrocoagulation needle for the scalpel. Kelly told, very graphically, how and why he had used this method for over one year and had practically abandoned the use of the knife. He had found it of great value in the removal of various carcinomatous growths. An entire breast and lymph nodes had been removed without the use of the knife. Some of the advantages he pointed out were: The avoidance of hemorrhage, the simplicity with which the penumbra of a carcinomatous area was reached, the prevention of metastases by the sealing of surrounding lymph structures, the avoidance of trauma, a general insult to remaining tissue by the absence of sponging, clamping, and the general handling of tissue.

Another point of interest touched upon was the destruction *in situ* of distant lymph nodes by electrocoagulation. He gave an instance of a metastatic lymph node being destroyed in this fashion in the neighborhood of Poupart's ligament. He termed this process the explosion of the node, and showed how this could be extended to pelvic and abdominal surgery. Many hours could thus be saved in major surgical operations and he felt that the procedure was far more effective. He also gave several instances of the application of these methods to secondary invasions due to carcinomatous processes.

Great skill was required in the handling of the apparatus in order to avoid various mishaps, but

it was felt that these obstacles could be overcome. From all the evidence shown this new method of surgery should be epoch making and a more widespread knowledge of the technic seems highly important. These methods should revolutionize surgical methods. A wider use of it will undoubtedly bring many new points in its perfection.

THE INCREASE OF MEDICAL KNOWLEDGE

Increase of medical knowledge during recent years has come from researches in physiology and biochemistry rather than from investigations of bacteriology and pathology. It is in these fields of research, too, that the best results may be expected in the future. As a matter of fact, bacteriology is halted because a closer knowledge of the infective organisms and their biochemistry is required before advance can be made. As for pathology, it also waits largely on biochemistry, in that it only shows signs of progress as a study of the reactions of the body to disturbance, and in so far as it can express its phenomena in terms of biochemistry. Also, the pathologist is confronted by a task which has long hindered the improvement and accretion of medical knowledge, to wit, the elucidation of the question of the invisible viruses, which it is said, and indeed there is good reason to believe, are the originating causes of many of the most frequent and troublesome diseases, of which measles, whooping cough, mumps, encephalitis lethargica, and perhaps influenza, may be mentioned.

In this category may be included several of the animal diseases, as, for instance, foot and mouth disease, which inflict immense losses and some of which may be communicable to man. In this connection it is encouraging to know that the study of comparative pathology is gaining ground and that by its means and the use of the greatly improved microscope the causative factors of some of these hitherto infections of obscure origin may be discovered.

Physiology and biochemistry have given to the world within the past ten years or so valuable and for reaching new knowledge with regard to nutrition. In this direction progress has been most notable. The vitamines, while somewhat resembling the invisible viruses, in that they are more or less hypothetical, have enriched our previous knowledge as to diet. It may be more correct to say that our knowledge of the mineral salts, and the proportion of each which go to make up a healthy and adequate diet has been greatly augmented because it is believed on sound grounds that if in a diet the mineral salts are present in fairly proper proportions, the vitamines will be there as well. However, without attempting to split hairs, it certainly may be stated that our knowledge of the laws of nutrition, if such a term be applicable, has been furthered to a very appreciable extent.

Much has been added to our former knowledge on the causation of rickets. Lengthy experimental work, especially in Vienna during the semistarvation period of that city's recent history, has apparently confirmed views, to some extent, as to it being a disease of dietetic deficiency. Moreover, in America and in Great Britain this point of view has been elaborated and refined by dietetic experiments made with various animals. At the same time the dietetic influence on the causation of rickets has been almost overshadowed by retarding the effects which light and sunlight in particular, have been shown to exert on the development of this disease of faulty bone formation. It has been known empirically for many years, Hippocrates knew, that light had remarkable curative powers, powers which are still little understood.

Physiologists at the present time are active in analyzing the action of light in order to explain the why and wherefore of its surprising remedial and curative properties. It seems that vitamines may be present in light, that is, that there is an apparent interchangeability of light and vitamine action. Although some of those who have made a special study of rickets are inclined to exaggerate the baneful effects of the lack of light in the causation of rickets, the majority perhaps of investigators in this field hold that both lack of light and an inadequate and unsuitable diet are concerned in causing this crippling condition which has been a long standing curse in industrial and smoky cities. Rickets is not the only disease which is fostered and developed by a comparatively sunless atmosphere.

Tuberculosis is as much a disease of the smoky, dimly lighted slums as rickets and practically all chronic diseases, including that farspread and invaliding malady rheumatism, are to a greater or less extent injuriously affected by insufficient light. The results already reached by investigations in the field referred to above have been most encouraging, and give rise to the hope that disease, even in the near future, will be largely diminished and that the health of the people and the beauty of the country will increase in a corresponding degree. Another point which should be noted in this incomplete survey of the increase of medical knowledge, is the advance that has been made in clinical studies. Most of the chief contributions to medical science of the past few years have been the results of clinical investigations, for example, of the functions of the heart, the excretory efficiency of the

kidney and the regulation of the respiratory mechanisms of the body. And this progress has been rendered possible because investigations were carried out by men trained in the exact methods of physiology and biochemistry.

Further steps in the forward march of physiology and biochemistry will capture new positions from which successful attacks can be launched on the citadel itself. It should be borne in mind that successes in medical science although they may appear spectacular, are generally speaking the ultimate result of many years of patient and persistent labor conducted, as a rule, by many investigators in different countries. Often, unfortunately, the man who has found the keystone or done most of the spade work does not gain the reward which is his just due. Medical science is bound by no national limits and its discoveries are gifts to humanity and yet the laborer is worthy of his hire. In this respect again signs are more hopeful and it is being realized more and more thoroughly that it is for the good of all that the research worker should be rewarded generously. It may be added that it is in America the inhabitants are most alive to this aspect of the situation.

MENTAL AND PHYSICAL WORK

The report of "breakdowns from mental work" are frequent, but we wonder if this, like some other phrases used with common glibness, really has the meaning it seems to imply.

We are all so accustomed to pigeonholing things, and especially to building up impenetrable partitions between anything that savors of what we call material and anything that savors of what we call immaterial, that when we speak of mental breakdowns we consider that something has occurred altogether apart from a mishap of the physical machinery or because of something which happened to the physical machinery.

What is mental work and how does mental work differ from physical work? As an example of mental work, we are usually referred to what a child does in school. He is shown certain objects or pictures of objects and certain collections of marks, which are called names for these objects, he is impressed with through eyes and ears, and he reproduces vocally or tactually (by the use of muscles) these signs or symbols for objects. By repetitions he so impresses his brain cells that, on appropriate stimulation, they are able to react after an interval and again to carry out the muscular movements made in reproducing these symbols. There is a use of sense organs, nerve arcs, and muscles—a very physical performance not unlike the activities that went on ancestrally before schools or letters or even words were invented. There is nothing new about mental work, and nothing about such work that is not as physical as that of chopping wood or carrying water. It should also be borne in mind that wild animals in captivity, doing no mental work of this type, suffer from nervousness, sometimes go insane—have "mental breakdowns."

There are only two features in which this mental work of man differs somewhat from other work—in the acquiring and using of symbols (words) and in the more intense use of the eyes and of the smaller muscles for speech and for writing. Of these the use of the eyes as they were never before used is a most trying factor, and such use may result, as some of us are painfully aware, in a general upset of the whole organism.

There is a form of mental work which seems more lacking in physical accompaniment, such as the doing of mathematical problems without use of the eyes or fingers (mental arithmetic) or the planning out of some piece of work which will later be executed vocally or tactually. Again, however, physical machinery is at work and leading as much as following (after the button has been pressed by the original stimulus) in such production.

Studies recently conducted by Ilzhöfer of Munich as to the amount of energy used in mental work show that the caloric expenditure for such work is so trifling that the experimenter pronounced it hardly more than appreciable.

Why, then, mental breakdowns? Mental breakdowns are physical breakdowns which may, or may not, include a derangement of the cerebral machinery, but the wear and tear which brings them about can hardly be located in that organ at all. Eyestrain is a factor which leads to indigestion and a train of attendant evils, but probably, aside from this cause, the breakdown is brought about by reflex physiological disturbances originating in worries and anxieties connected with the progress or outcome of the work, which are really in no way a direct part of the mental work itself.

The bad hygiene, mental or physical, which often accompanies the intellectual life, does not tend to make mental breakdowns less frequent, while the general equipment in physique is an important factor.

Mental breakdowns are, then, physical breakdowns due to general stress and strain upon the whole organism arising from physical defect, inherited or acquired, and from bad physical hygiene or unhygienic attitudes toward life. After all, there is no such thing as mental activity without physical, any more than there is (to our knowledge) mind apart from body, though one is as immaterial as the other for aught we know.

TREND IN PROFESSIONAL HEALTH EDUCATION

Medical schools we have had with us for a long, long time. Perhaps they reached their culmination (in this country) as to numbers and attendance near 1890. At any rate, there were some 133 schools, about five thousand students, and around three thousand graduates. This was only about a decade after the discoveries of Koch.

Since 1890 the number of schools, the number of students, and the percentage of graduates has declined more or less steadily, until there are now some eighty schools, perhaps thirty-five hundred students and a thousand graduates. One can only speculate as to what the numbers might have been had nothing been done to improve the character of the schools and to make more difficult the acquirement of a state license. It is probable, however, that there would have been some decline in the number of schools and of graduates, through the influences of supply and demand. The very regulation of schools and courses which came about was, however, by way of a natural reaction, even if it came within a brief period and, chiefly, through the profession itself. There was real need for the reduction.

About 1906 the first professional course in public health was announced. It was one year in length, and few students were registered. The number of universities giving these courses of from one to three years' extent has now increased tenfold and the graduates (of all degrees) will now number annually about a hundred. Considering that medical schools date back for hundreds and thousands of years, the rapid rise of this new department of education is significant. However, like some other things apparently new, it grew from germs already developing within the medical school itself.

About forty years ago, or not long before medical schools reached their acme in quantity, though not in quality, there were some two schools of physical training or gymnastics in this country with a two year course and a handful of students. The number has increased with cumulative momentum, and, at last accounts, the number of special schools, of universities, colleges, and normal schools giving graduate courses (most of them of four years) had reached beyond fifty and seems likely to soon pass a hundred, while the students and graduates will number in the thousands. Moreover, these schools have changed from schools of gymnastics to schools of physical education and hygiene. More than this, there are now a few universities giving graduate courses in these subjects. This sudden sprouting of schools of this type was stimulated to some extent by recent state legislation for physical education and health teaching, and this, in turn, by the war; but as these things came by way of development, just as cyclones and earthquakes come through long existent causes, this phase of professional training for health work may be said to have been natural. The seeds were laid, on the one hand, by all previous wars (for every nation gets wonderfully worked up over the physical condition of its cannon fodder just after every great conflict), but, on the other hand, by farseeing prophets in education, from Rabelais to Spencer.

Another change, less spectacular, has come to pass in the education of the nurse. True, the courses in Public Health Nursing which have been evolved in the past decade have been postgraduate courses, but they are different from those offered by the old training in mere bedside nursing and lead to a variety of work in which the treatment of disease is but one phase.

It is interesting to note, in passing, that some mushroom schools of healers of sundry sort have arisen within the few decades we have reviewed. Their importance has been trifling from a pedagogical viewpoint, for they had little to teach, though much to gain (from tuition fees), and it is exceedingly interesting and significant that they have turned out people not interested in health. The products of these schools are intent on the treatment of disease, but not at all on its prevention.

In the midst of all this marvellous change the medical school still holds its important place, improved in every respect, and offering training, not only in the cure of disease but, through research and personal advice to the patient, in its removal from the earth so far as that is possible.

SANATORIUM TREATMENT OF TUBERCULOSIS

When sanatorium treatment for pulmonary tuberculosis first came into vogue, it was hailed far and wide as the greatest advance in the treatment of the disease that had ever been conceived and established. For several years after the inauguration of the sanatorium system this optimistic view prevailed. Gradually, however, doubts as to its efficacy crept in until now, while it has not fallen into disrepute exactly, its limitations are frankly recognized by all authorities on tuberculosis. Dr. Noel Bardswell, than whom few have had more experience of sanatorium treatment, speaking at a meeting of the Harveian Society held in Paddington last November, concluded that for working class patients, suffering from pulmonary tuberculosis, unless in the earliest stages, the sanatorium could not be regarded as an effective cure. A comparatively brief stay, as consumptives in an early stage usually make, is of little or no value and in the more ad-

vanced stage sanatorium treatment appears to be of no value whatever. Home environment, housing, occupation, habits, temperament and standards of living determine the consumptive's future to a much greater extent than does the period of sanatorium treatment.

In certain forms of tuberculosis, however, that is, tuberculosis of the larynx, Sir St. Clair Thomson spoke a good word for sanatorium treatment. In his opinion there was nothing else and nothing better. Of his own cases he could trace less than a dozen in which the patients had recovered without sanatorium treatment, whereas he had had 119 cases at Midhurst Sanatorium alone, where the larynx had cicatrized well and with few exceptions remained so. As he pointed out forty years ago, "There was never any expectation of cure. The appearance of tuberculosis of the larynx was the signal of death." The subject was of great importance, since it was calculated that today in England and Wales about one hundred and sixty thousand persons suffered from laryngeal tuberculosis. It was certainly the commonest specific disease of the larynx. In his youth such patients were tortured with insufflations and antiseptic powders, and he was accustomed to see the larynx as a horrible septic cavity. Nowadays, after a short time in a sanatorium, the larynx cleaned up in a way he had never seen in the old days. In his opinion sanatorium treatment was the first necessity; the next was rest for the voice either by whispering or better by silence. Silence was difficult at home even for the richest, but was easy in a sanatorium with other silent patients, and especially with trained nurses. The average percentage of cures of laryngeal tuberculosis by the three methods of silence, whispering and in selected cases the galvanocautery was 24.9 per cent., of the seventy-four patients selected for the cautery sixty-two per cent. were cured.

In reference to Dr. Bardswell's paper, Sir St. Clair Thomson said that the suggestion that if a case was sputum negative it was not tuberculous was absurd. Marked physical signs were quite sufficient evidence. He had himself seen a number of cases of laryngeal tuberculosis in which there never had been tubercle bacilli in the sputum. In many such cases the patients had recovered at sanatoria, but in many others they had waited for treatment till their sputum was positive and then died.

Sir William Wilcox said with regard to early diagnosis, he thought that one of the practitioner's greatest difficulties was that patients frequently waited too long before consulting a doctor. Another factor which had struck him as an examiner in medicine was the difficulty found by students in their five crowded years of study of learning the clinical signs of early phthisis. Many of them did not know how to percuss a chest, and some could not even percuss a heart. Percussion was a fine art, and too little respect was paid to it and to clinical signs, owing to the modern tendency to rely on laboratory work and x rays.

Dr. Dudfield, the president, said that the real solution of the problem was the improvement of housing conditions. At present these were almost hopeless for tuberculous patients; the overcrowding was horrible, and as a result of it much of the money spent on sanatoria was wasted.

Perhaps, the solution of the problem lies almost wholly in preventive measures, that is, in the improvement of housing, factories, and conditions of living and work generally. But a broadened sanatorium treatment, embracing colonies and workshops, may help the workingman in the early "moderately advanced" stage if he can be induced to stay sufficiently long to obtain real benefit. Even then the crux of the question is in housing and environment. On one point there is unanimity of opinion, that those advanced cases which are a menace to persons in propinquity should be isolated for safety's sake.

News Items.

New Officers of the A. M. A.—At the annual election, held on Thursday, May 28th, the following officers were elected:

Dr. Wendell C. Phillips, of New York, president-elect; Dr. Philip Marvel, of Atlantic City, vice-president; Dr. Olin West, of Chicago, secretary (reelected); Dr. Austin Albert Hayden, of Chicago, treasurer (reelected); Dr. Frederick Cook Warnshuis, Grand Rapids, Michigan, speaker, House of Delegates (reelected); Dr. L. Rock Sleyster, of Wauwatosa, Wisconsin, vice-speaker, House of Delegates (reelected).

Board of Trustees: Dr. Edward Henry Cary, of Dallas, Texas; Dr. Albert R. Mitchell, of Lincoln, Nebraska; Dr. David Chester Brown, of Danbury, Connecticut, and Dr. Joseph A. Pettit, of Portland, Oregon.

Council on Medical Education and Hospitals: Dr. Louis Blanchard Wilson, of Rochester, Minnesota; Dr. Walter Foster Donaldson, of Pittsburgh, and Dr. Ray Lyman Wilbur, of Stanford University, California.

Dr. John Shelton Horsley, of Richmond, Virginia, was reelected chairman of the Council on Scientific Assembly.

Next year's meeting will be held in Dallas, Texas.

Association for Study of Internal Secretions.—The ninth annual meeting of this organization was held at the Ambassador Hotel, Atlantic City, on May 26th, under the presidency of Dr. L. G. Rowntree, of Rochester, Minnesota. There were three scientific sessions. An interesting feature of the meeting was the symposium on the glands of internal secretion, the subjects discussed being the chemistry of the active principle of the glands of internal secretion, metabolic, circulatory, and psychical disturbances in diseases of the glands, and surgery of the glands. A resolution was adopted condemning the indiscriminate distribution of unproved gland products.

The American Academy of Physiotherapy.—The mid-year meeting of this society was held May 25th and 26th, at the Hotel Morton, Atlantic City. Of special interest was the symposium on ultraviolet rays, considering them in relation to growth and development, nasal and oral conditions, and tuberculosis; also the symposium on electrosurgical methods, discussing electrocoagulation, electrothermic methods, and endothermy.

American Life Convention.—The Medical Section of the American Life Convention will hold its fifteenth annual meeting in Louisville, Kentucky, June 2d, 3d, and 4th.

Nursing and Health Education.—The Teachers' College Bulletin, Columbia University, announces courses in nursing education, open to graduate nurses, and courses in health education, for teachers and supervisors.

Lincoln Hospital Closed.—Lincoln Hospital, in the Bronx, New York, which was founded eighty years ago for the care of negroes, but which has since cared for other patients, has closed, owing to lack of funds.

Tetanus Warning.—The Public Health Service has issued a warning regarding the use of bunion pads for shields or dressings for smallpox vaccinations, as several fatal cases of tetanus following vaccinations have been found by the Hygienic Laboratory to be due to tetanus bacillus in bunion pads.

Symposium on Hemorrhage.—The May 20th meeting of the Buffalo Academy of Medicine, section on obstetrics and gynecology, was devoted to hemorrhagic diseases of the newborn. Papers were read by Dr. Norman C. Benier, on etiology; by Dr. Marvin Israel, on symptomatology, and by Dr. Douglas P. Arnold, on treatment.

Veterans' Bureau Appointments.—In order to carry on the standardization of clinical and administrative service in the field, the Veterans' Bureau has assigned four supervisors to a tour of field duty: Dr. Winthrop Adams, for the New York district; Dr. E. P. Odenthall, New Orleans; Dr. Ord Everman, Chicago; and Dr. George O. Skinner, San Francisco.

Tuberculosis Association.—The New York Tuberculosis Association has changed its name to New York Tuberculosis and Health Association, to express more adequately its scope and purpose. A new activity of the organization is a community dental service, to be carried on in active cooperation with the Columbia School of Oral Hygiene.

Gifts and Bequests. — Washington University, St. Louis, will receive more than one million dollars for the establishment of the McMillan Eye, Ear, Nose and Throat Hospital, through the will of Sir W. Northrup McMillan, a former St. Louis capitalist.

The will of the late Emily A. Watson, one of the founders of the Orthopaedic Hospital for Crippled Children, contained many public bequests, among these being the following: Home for Incurables at Fordham, $50,000; Lincoln Hospital, $70,000; House of the Holy Comforter, Free Church for Incurables, $25,000; New York Skin and Cancer Hospital, $50,000; Fresh Air and Convalescent Home of Summit, N. J., $25,000; Montefiore Hospital, $25,000; Babies' Hospital of the City of New York, $25,000; Society for the Relief of the Destitute Blind, $25,000; St. Luke's Hospital, $25,000; Mount Sinai Hospital, $25,000; New York Association for Improving the Condition of the Poor, $50,000; New York Institution for the Instruction of the Deaf and Dumb, $30,000; Hospital for Scarlet Fever and Diphtheria Patients, $25.000; German Hospital and Dispensary, $10,000; Presbyterian Hospital. $10.000.

Hospital News.—The Knickerbocker Hospital, New York, broke ground recently for the first unit of its new buildings, to cost $500,000, at Convent Avenue and 130th Street. The total endowment sought for is $1,250,000.

A new addition to the Bon Secours Hospital of Baltimore, built at a cost of $300,000, has recently been formally opened.

The St. Louis City Hospital has constructed a three-story building for its radiology department, at a cost of about $100 000. Twenty-two rooms are provided, and a personnel of sixteen.

The New York Homeopathic Medical College and Flower Hospital reports that nearly $800,000 has been raised toward a million dollar endowment fund for drug research.

The Jamaica, L. I., Hospital, is opening a new five story addition. When plans are completed, this will be a hospital representing an expenditure of about one million dollars.

The New York Orthopedic Dispensary and Hospital is building an addition which will increase its dispensary space and also contain rooms for thirty-two private patients. This hospital has also opened a branch at White Plains, with rooms for thirty-five adults, in connection with its convalescent service for patients with joint tuberculosis. With these additions a total of some three hundred patients can be cared for.

Convalescent Care.—A meeting is announced to be held under the joint auspices of the Public Health Committee of the New York Academy of Medicine and the Hospital Information Bureau of the United Hospital Fund, Thursday, June fourth, at four o'clock, at the Academy, for the presentation of reports on standards of care and management of the convalescence of medical, surgical, pediatric, and neurological patients.

Columbia Appointments.—The following promotions in its medical staff were announced on April 25th by the trustees of Columbia University: Dr. Robert A. Lambert was named professor of pathology and director of the School of Tropical Medicine in Porto Rico. Dr. Nathaniel R. Norton, now associate in diseases of children, was appointed professor in that department. Donald H. Cook, Ph.D., was appointed associate professor of chemistry and was nominated to the board of trustees of the School of Tropical Medicine for appointment to the professional staff of that school. The following assistant professors were raised to the grade of associate professor: Dr. William C. Johnston, pathology; Dr. William C. von Glahn, pathology.

Society News.—The Harvard Medical Society of New York City has elected the following officers: President, Dr. Clarence W. Lieb; vice-president, Dr. Thomas E. Lavell; treasurer, Dr. Joseph C. Horan; secretary, Dr. James R. Lincoln.

Representatives of five national otolaryngological associations, at the invitation of Dr. George E. Shambaugh, recently met in Chicago and organized the board of directors of the American Board of Otolaryngology, as follows: Dr. Harris P. Mosher, Boston, president; Dr. Frank R. Spencer, Boulder, Colo., vice-president; Dr. Hanan W. Loeb, St. Louis, secretary-treasurer; Dr. Thomas E. Carmody, Denver; Dr. Joseph C. Beck, Chicago; Dr. Thomas H. Halsted, Syracuse, N. Y.; Dr. Robert C. Lynch, New Orleans; Dr. Burt R. Shurly, Detroit; Dr. Ross H. Skillern, Philadelphia; Dr. William P. Wherry, Omaha.

The American College of Radiology and Physiotherapy, at its recent meeting in Chicago, elected the following officers: Dr. John S. Coulter, Chicago, was chosen president-elect; Dr. Harry E. Steward, New Haven, Conn., Dr. Walter Scott Keyting, Salt Lake City; Dr. W. B. Chapman, Joplin, Mo.; Dr. Disraeli W. Kobak, Chicago, vice-presidents; Dr. Roy W. Fouts, Omaha, secretary, and Dr. Edwin C. Henry, Omaha, treasurer.

Personal.—Dr. John L. Kantor, of New York, spoke on constipation before the Lackawanna County Medical Society, of Scranton, Pennsylvania.

Dr. S. S. Goldwater, of New York, spoke at the dedication of the Butterworth Hospital of Grand Rapids, Michigan. Doctor Goldwater had served as consultant during its planning.

Dr. Louis Tulipan has been appointed chairman of the special committee on new members of the Medical Society of the County of New York, to succeed Dr. Maximilian A. Ramirez, who recently resigned.

Dr. George Draper of New York spoke on Observations on the Relation of Human Constitution to Disease, before the Atlantic County, New Jersey, Medical Society.

Dr. Raymond F. C. Kieb, superintendent of the Mattewan State Hospital, is to attend the International Prison Conference, in London, as delegate.

Dr. Edward O. Otis has been presented with a silver loving cup in recognition of six years' service as president of the Massachusetts Tuberculosis League, and has been made honorary president.

Dr. William E. Caldwell of New York spoke before the Atlantic County Medical Society on Source of the Pathological Findings in Stillbirths and Neonatal Deaths.

Dr. William W. Keen, of Jefferson Medical College, Philadelphia, has been elected a foreign honorary member of the Royal Academy of Medicine of Belgium.

Dr. Jonathan Pearson, Director of the Division of Tuberculosis of the New York State Department of Health, has resigned to enter private practice at Baldwin, Nassau County, New York.

The knighthood of Dannebrog, the highest honorary order of Denmark, has been conferred on Philip P. Jacobs, Ph.D., of the National Tuberculosis Association.

Joseph V. dePorte, professor of mathematics and statistics of the New York State College for Teachers, has been appointed director of the division of vital statistics for New York state, to succeed the late Dr. Otto R. Eichel.

Foreign Correspondence

VIENNA LETTER

(From our own correspondent)

VIENNA, *April 29, 1925.*

THE SCARCITY OF TENEMENTS AND THE OCCURRENCE OF NEUROSES AND PSYCHOSES IN VIENNA

Dr. Margit Herz has carefully studied the anamnestic data afforded by the patients of the neurological and psychiatric clinic of the Vienna University. She says that beyond the frequent mentioning of deficient nutrition she has frequently heard also about deplorable housing conditions. Crowding into furnished rooms, sometimes three and even four families, and flats suitable for one family only being occupied by three families, produced a situation conducive to immorality, litigation between husband and wife, jealousy scenes, sleepless nights, in fact, all the factors which go to create the socalled nervous habit, ending in various nervous and psychical manifestations. Dr. Herz proves with numerical data that the present social conditions are responsible for a great number of the mentioned mental diseases. In the female section of the clinic, during the last two and a half years, out of 4,703 patients there were eighty-seven in whom the question of housing had an important bearing on the occurrence of the disease. In about 240 cases the difficulty to get a suitable tenement had acted as the provocating agent of the mental trouble. In nine cases very severe depression developed, ending in attempted suicide, which was frustrated by relatives, and others near at hand; in others excessive restlessness and even furiousness developed. In twenty-five cases the psychosis turned into paranoia (paranoia magnans, paranoic shizophrenia). In some cases true melancholia developed; among these there were some in whom the existence of housing difficulty as a cause could not be proved. In several unfortunate women epileptiform fits made their appearance; every one of these involved the unpleasant occurrences by reason of their fright from requisitioning.

This unfortunate solution of the housing difficulty is causing very distressing conditions in the socalled successor states, that is the small states which have received the cutoff parts of the late Austro-Hungarian monarchy. In these parts nominally the new rulers place their own national officials in all public offices, and in the towns for these new inhabitants parts of existing larger tenements are requisitioned. Of course, the new tenant thus displaced in a tenement is, in most cases, tyrannizing the whole house, he being a member of the ruling nation, while the boss, the original tenant, is only a late enemy. Family happiness, peace between wife and husband, are the sacrifices of this unblessed state of affairs. This is a much cheaper way of solving the housing question than to build new houses, which is hindered instead of being encouraged. For instance, in Transylvania, a big territory, formerly part of Hungary, now owned by Roumania, the late Hungarian population would willingly build new houses, but for an order issued by the Ministry of Internal Affairs, which order enacts that the favor which was granted to builders of new houses by the late Hungarian state, consisting of exemption from state taxes (and there are still the late Hungarian laws prevailing in Transylvania), is annihilated, and also the assurance from the part of the state of being exempted from requisitioning, the only point that would encourage people to build new houses.

THE RECOGNITION OF FOREIGN DIPLOMAS IN CZECHOSLOVAKIA

The Karoly University in Prague has petitioned the Czechoslovakian Ministry of Public Instruction to grant to the university the monopoly right of being the only university in the land where the nostrification of foreign diplomas is executed. According to the petition the other university of Prague, the German University, cannot be held competent in arbitrating whether the candidate is well versed in the use of the language of the state, and whether he is reliable from civil and national points of view. In so doing the Czechoslovakian ministry would introduce a kind of numerus calausus (percentage norm), inasmuch as only one per cent. of the number of the total, in Czechoslovakia promoved doctors would be allowed to apply for nostrification, and in proportion of the ratio of the different nationalities living in Czechoslovakia as stated by the last census.

INSULIN IN THE TREATMENT OF CANCER

At a recent meeting of the Vienna Medical Society, Dr. Silberstein, lecturer at the Vienna University, assistant at the clinic for experimental pathology, gave a lecture, in which he described his experiments on animals as to the relation of carbohydrate metabolism to cancer. He was induced to make his experiments by the findings of the German biochemist, Otto Warburg, who had established that cancer cells decomposed much greater quantities of grape sugar than was needed by normal tissues. With this fact the relation of cancer and sugar metabolism came into the foreground. Now Dr. Silberstein experimented with insulin, in order to ascertain its effect upon the cancerous organism. He experimented with mice, causing cancerous growths on their backs by painting them frequently with coaltar. It was striking that the mice thus treated reacted upon insulin injection before the appearance of the first cancer node, quite differently from those not treated with coaltar painting. The former showed a much greater sensibility to insulin, inasmuch as one sixth to one half of the letal dose has killed them.

If the artificially produced cancer nodes are excised, fresh cancer nodes make their presence in the animal after a shorter or longer interval. The new nodes appear at different places of the body. Dr. Silberstein has observed the action of prolonged insulin application upon these animals and he could establish the fact that the cancer nodes have shown either a very protracted development, or they did not grow further at all if insulin was administered for a good length of time. If, however, the animal was given the greatest doses of insulin endurable after the excision of the cancer nodes, recurrences

were striking by their absence in fifty per cent. of all cases. According to this finding it is possible to render a cancerous organism more resistant to the extension of the cancerous growth by administering large doses of insulin. Dr. Silberstein requested the audience to assist him by placing at his disposal human excised cancerous tumors. He also advised that in cases of inoperable cancers they should try to apply the greatest possible insulin doses. With regard to the still hopeless state of cancer therapeutics, the good results attained by Silberstein on animals are at any rate encouraging further study on human subjects.

NEOSALVARSAN DEATHS IN ROUMANIA

The Roumanian daily press has written sensational articles—for want of sufficient competency in the matter—on some fatalities which have occurred in the Bucharest military hospital lately. Some papers have been so tactless as to intimate that the Germans sell to Roumania poisoned neosalvarsan as a "revenge." The university committee that has been sent out to investigate the matter has verified that three officers, a major, a captain and a lieutenant, the alleged victims, were suffering from grave organic diseases, the major and the captain from advanced locomotor ataxia and the lieutenant from diabetes. The members of the committee opened some vials taken from the chemical laboratory of the military hospital, and exposed the contents to the action of the air until oxidation took place. They afterwards inoculated two rabbits with the preparation and neither of them died. The committee passed its report to the Ministry of Public Welfare and closed with the statement that although very rarely fatalities are inevitable with the administration of neosalvarsan, nevertheless according to the present viewpoint of science and practice neosalvarsan is the specific remedy for syphilis. The Hamburg Court of Justice brought sentence last year against over forty persons proved to have falsified neosalvarsan.

X RAY DEATHS IN THE DRESDEN STATE CLINIC

In the State Clinic at Dresden two women have sustained such severe x ray burns, while being treated with deep penetrating rays, that both succumbed in great agony. The Court has sentenced professor Dr. Lahm, the director of the clinic, to 3,000 gold marks fine (about $750), while the junior surgeon who performed the treatment, and his assistant, a nurse, were sentenced to two months' imprisonment for manslaughter.

COMPENSATION FOR A DOCTOR INFECTED WITH TUBERCULOSIS

A junior physician of the Krankenhaus am Friedrichshain in Berlin has sued the city of Berlin for compensation, having become infected with tuberculosis while doing service in the tuberculous section of the hospital. He demonstrated that there were unhealthy conditions in that section, and that little had been done to prevent the possible transmission of infection. Up to the present three physicians and eight nurses have contracted consumption. The Court has brought sentence in favor of the doctor and ordered the city of Berlin to pay all his expenses for treatment, including half year's stay in Davos, Switzerland, and at the same time has obliged the city to pay him an annuity for his whole lifetime, and besides this has ordered the urgent restoration of the hospital in such a wise that similar sad occurrences could not take place in the future.

VIENNA HYGIENIC EXHIBITION

The international hygienic exhibition, arranged by the world famed hygienic institute in Dresden, was opened on April 28th.

LONDON LETTER

(*From our own correspondent*)

London, *April 14, 1925.*

MANCHESTER RADIUM INSTITUTE

At the annual meeting of this Institute, which was held on April 2d, the attendance was the largest on record, and the report presented by the radiologist, Dr. Arthur Burrows, showed that of 843 patients registered, 776 received treatment, the remainder being found unsuitable. The total number of cancerous patients treated was 577. A considerable improvement of immediate symptomatic cures was noted. At the end of the year 153 patients were described as well and 288 improved. Ninety-three cases of malignant disease, exclusive of rodent ulcer, were rendered free from symptoms and signs of disease. The number of rodent ulcers treated was 101, and of these 53 were well at the end of the year. The total number of outpatient attendances was 6,234, and the number of inpatients 966. Of the twelve beds for inpatients eight are used for non-paying patients. Last year the expenditure exceeded the income by £855. Sir William Milligan, honorary secretary and treasurer, said that they were probably a long way from the actual cure but they were definitely arresting the disease for periods of three, five, and seven years among people pronounced by the most competent surgical authorities as inoperable and incurable.

SIR HUMPHRY ROLLESTON REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE

Sir Humphry Rolleston, reelected recently president of the Royal College of Surgeons, has been chosen to fill the place of the late Sir Clifford Allbutt as Regius Professor of Physic in Cambridge University. Sir Humphry Rolleston, it need hardly be said, is eminently fitted to succeed his friend, Sir Clifford Allbutt, to this highly honorable position. He is an extremely cultured, learned man and collaborated with Sir Clifford Allbutt in editing the *System of Medicine* which is known by Allbutt's name and which has won a world wide reputation.

BOOKS

A second edition, thoroughly revised and added to, of Sir Kenneth Goadby's *Diseases of the Gums and Oral Mucous Membrane* has been published recently by Mr. Humphrey Milford, Oxford University Press. The book is probably the best ever written on the subject and is profusely and artistically illustrated. Two new features have been introduced—a chapter on vaccine therapy and a section on toxic heart. In the part dealing with toxic heart the author had the cooperation of Dr. Strickland Goodall.

Book Reviews

DIGITALIS AND ITS ALLIES

The Action and Uses in Medicine of Digitalis and Its Allies. By Arthur R. Cushny, M.D. New York: Longmans, Green and Co., 1925.

Professor Cushny has been actively identified with researches on digitalis of the past thirty years. A book from his pen, summarizing our present knowledge of the pharmacology and therapeutic use of digitalis and its allies, is assured an eager reception. A careful perusal of this monograph fully justifies the anticipations and expectations of the reader. The introductory historical chapter is followed by a detailed consideration of the action of digitalis on the frog's heart and on the mammalian heart. One chapter is devoted to its action on the blood pressure and on the bloodvessels. The author again emphasizes the well known fact that in therapeutic doses digitalis has no pressor action. There is a careful review of the extracardiac action of the drug.

The section on digitalis in therapeutics is very clear and comprehensive. Dr. Cushny does not advise the routine treatment of pneumonia with digitalis but prefers waiting until some special indication is presented. He points out that while digitalis is contraindicated in partial heart block, it may be useful in complete block. He commends the Eggleston method of quick digitalization in urgent cases, but advises the slower method when the symptoms are less pressing.

A well selected and comprehensive bibliography of 559 titles is appended. The printer's makeup of this tabulation deserves special commendation. Dr. Cushny's monograph should find a wide circle of readers among physicians in all fields of medicine, as well as among medical students.

SOCIAL PSYCHOLOGY

Social Psychology. By Floyd Henry Allport, Associate Professor of Psychology, University of North Carolina. Boston, New York, Chicago, San Francisco: Houghton Mifflin Company; Cambridge: The Riverside Press, 1924. Pp. xiv, 453.

Social psychology has been approached in a peculiarly illuminating manner through an examination of individual psychology. This in turn is thoroughly studied in the genetic upbuilding of a personality in its adjustments to the environment in answer to its needs. The individual is not born equipped with fully formed reactions, instincts ready to hand for loving his parents or entering into large social relations. All his social habits must be learned. These depend upon the conditioning processes by which the individual is surrounded; they are the personal reactions to the stimuli which are presented to the individual from the earliest hour. The importance of the sex relation to the personality is considered in its broadest sense and as a farreaching one in the socialization of the individual. The training of the child, or better his "conditioning," for the proper sex adjustment is especially well set forth, though the author's slight change in terminology from Freud's exposition of child sexuality seems scarcely necessary. He attempts to point a distinction between "Freudian facts," which he accepts, and "Freudian theory," into which he has read some unnecessary and nonexistent grounds for objection. On the whole the book enters both widely and deeply into the emotional and behavioristic factors which belong to the development of a personality and reveal that personality to be indeed, as the author states, largely a social fact. It is a vital presentation of psychological material in an eminently practical form.

YELLOW FEVER

Experimental Studies of Yellow Fever in Northern Brazil. By Hideyo Noguchi, Henry R. Muller, Octavio Torres, Flaviano Silva, Horacio Martins, Alvaro Ribeiro dos Santos, Godofredo Vianna and Mario Biao. Monograph No. 20 of the Rockefeller Institute for Medical Research, August 9, 1924.

This monograph describes the isolation of Leptospira icteroides from cases of yellow fever in the interior of Bahia; the pathogenicity and biological properties of the Brazilian strains; and immunological studies. 0.0001 c. c. of the antiicteroides serum prepared in horses with strains of Leptospira icteroides of Ecuadorean, Mexican, and Peruvian origin protected guineapigs against one thousand minimum lethal doses of a Brazilian strain.

VASCULAR VARIATIONS

Traité des Variations du Système Artériel. Pelvis et Membre Inférieur. Par le Dr. Louis Dubreuil-Chambardel. Paris: Masson & Cie, 1925.

This presentation is based on the study of hundreds of cadavers at the medical schools of Tours under Le Double. The notation of departures from the normal or, better, the usual arrangement and distribution of nutrient bloodvessels, is of recognized practical importance for the surgeon and clinician. The classification and, if possible, the explanation of such anomalies cannot fail to interest the student of comparative anatomy, the biologist, and all of those who, to quote the preface of Prof. A. Nicholas, *"curieux de dépasser les faits, y chercheront matière à spéculations sur l'origine des variations."* The author, a pupil of the anthropologist, Manouvrier, has found in embryology a key to many if not all of the vascular variations noted.

NERVOUS DISEASES

Nervenkrankheiten. Die wichtigsten Kapitel für die Praxis. By Prof. Dr. Hans Curschmann, Rostock. Klinische Lehrkurse der Münchener medizinischen Wochenschrift, Band 2. München: J. F. Lehmann's Verlag, 1924. Pp. 228.

Curschmann has not been afraid to point out in an emphatic style—brief sentences, direct, pointed statements, exclamation points when necessary—that he is writing of a subject of utmost importance not to the specialist alone. He drives home the fact that the general medical man must know of the existence and much of the nature of the disorders of the nervous system and still more important of the psychic personality. For all these he meets constantly in his medical service and their recognition and treatment may be neglected. The survey given is a comprehensive one though comprised in a small and convenient space. Not only are the facts presented in a manner to be easily grasped for practical use of them but the emphasis is well distributed upon the most important points of diagnosis and significance of the symptoms presented. The au-

thor's view is always that of a dynamic organism presenting symptomatic reactions, never that of one interested only in describing isolated disease entities. This is particularly manifest in the important field of the psychoneuroses, in hysteria, to choose a striking example. Yet here one feels some disappointment that the author has not given fuller etiological explanation on the basis of the dynamic struggle of the personality, which would have led also to fuller therapeutic suggestion. Has his reluctance to follow Freud blocked him just where he had promised most?

PHYSIOLOGICAL CHEMISTRY

A Laboratory Manual of Physiological Chemistry. Elbert W. Rockwood, M. D., Ph. D., and Paul Reed Rockwood, M.D. Fifth edition, revised and enlarged. Illustrated with four colored plates and forty-three text engravings. Philadelphia: F. A. Davis Company, 1924. Pp. 413.

This edition has been thoroughly revised, new methods inserted, and the text brought up to date. It is a very good laboratory guide for the use of those who are studying physiological chemistry for the first time.

ROCKEFELLER INSTITUTE REPRINTS

Studies from the Rockefeller Institute for Medical Research, Volumes LI and LII. New York: The Rockefeller Institute for Medical Research, 1924 and 1925.

These bulky volumes totalling about 600 pages each contain the collected reprints of articles which have appeared in various journals during the year from the Rockefeller Institute for Medical Research, and most of which have been abstracted in these pages.

BACTERIOLOGY

Handbook of Bacteriology for Students and Practitioners of Medicine. By Joseph W. Bigger, M.D. (Dublin), F. R. C.P.I., D.P.H. New York: William Wood and Company, 1925. Pp. 413.

This is a short textbook of bacteriology of somewhat limited scope. It is not quite suited for independent student work in the laboratory, as the directions are not sufficiently detailed for the average student to carry out the procedures without a good deal of help from the instructor. The illustrations are sufficient, and the press work good.

MICROMETHODS

Microméthodes et Semi-Microméthodes appliques aux Analyses du sang et des humeurs. By Dr. Durupt. Paris: A. Poinat, 1924. Pp. 234.

This useful little pocket manual contains directions for performing most of the current micro-analytical procedures. For the laboratory worker it will prove a serviceable guide.

ELECTRICAL CONDUCTIVITY

La Conductibilité Electrique due Corps Humain. Par André Strohl. Paris: Masson et Cie, 1925.

The author's studies, under Prof. Weiss at Strasbourg, are of great interest, clinically as well as experimentally. He reviews the history of investigations as to the nature and degree of resistance of living tissues to various types of electric currents, and to varying intensities and modalities. Working with a ballistic valvanometer, the passage of a current of constant voltage was found to be attended by marked variations in intensity, due largely to polarization of the tissues. The studies of Philippson on changes in electric conductivity accompanying cadaveric changes in muscles, similar variations in germinating plants, and in anaphylactic shock, the observations of Watermann on polarization in malignant growths, are suggestive, in this connection, of the wide application of Strohl's careful measurements and their possible bearing on medical science.

PEDIATRICS

Clinique Médicale des Enfants. Affections de l'Appareil Circulatoire. Par P. Nobécourt. Paris: Masson et Cie, 1925.

The author has made numerous contributions to the science and art of pediatrics, notably his volume on cardiopathies in childhood. The work under review is by no means a repetition, as it deals as Nobécourt himself reminds us, more with *malades* than with *maladies*. He details their histories—family, past, and case—describes the methods employed to arrive at a correct diagnosis; points out the difficulties met with, and presents the therapeutic indications. In common with his renowned predecessors, Corvisart, Potain, and Henri Roger, the author calls attention to the frequency of cardiac affections in infancy and childhood, the possibility of latent lesions, and of affections with slight symptoms if any. The relation to rheumatism, tonsillar foci, and bacterial infections are also considered. The book is illustrated with a large number of tracings of percussion findings, all reduced uniformly for purposes of study and comparison, and with radiographs of the heart area.

THE BLOOD

The Blood: A Guide to Its Examination and to the Diagnosis and Treatment of Its Diseases. By G. Lovell Gulland, C.M.G., M.A., B.Sc., F.R.C.P.E., and Alexander Goodall, M.D., F.R.C.P.E. With twenty-nine text illustrations and sixteen colored plates. Third edition. New York: E. B. Treat and Company, 1925. Pp. 424.

The third edition of this text does not show any great changes from the previous ones. A few cuts have been changed, and additions have been made to the bibliography. It seems odd to find a chapter on Status Lymphaticus in a book on diseases of the blood, and certainly more recent references to the treatment of this condition by x rays could be found than 1910. The chapters on malaria and blackwater fever have been rewritten and much improved thereby.

EXPERIMENTAL MEDICINE

Handbuch der viologischen Arbeitsmethoden. Unter Mitarbeit von 500 bedeutenden Fachmännern herausgegeben von Geh. Med.-Rat Prof. Dr. Emil Abderhalden, Direktor des Physiologischen Institutes der Universität Halle a.d. Saale. Berlin, Wien: Urban & Schwarzenberg, 1924.

In Abt. XIII, Teil 2, Heft 2 of this encyclopedic work, E. Friedberger dilates upon the technic and nature of the Pfeiffer phenomenon, which consists of the breaking down of pure cultures of micro-organisms that are introduced locally into the bodies of experimental animals and the microscopical study of this process from time to time in specimens taken from the site of introduction. The history and nature of this phenomenon, its practical utility and the technic are given in most minute detail. L. Michaelis describes the technic, practical application and theory of acid agglutination. Both of these articles are extremely technical and valuable chiefly

to the laboratory worker. C. von Pirquet and H. Koch write about the various types of local tuberculin reactions and their indications in man and animals. This monograph is very practical.

In Abt. IV, Teil 8, Heft 5, K. Amberger treats of the methods of examining alcohol and alcoholic beverages (wine, beer, brandy and cordials), C. Griebel on the microscopical study of tobacco and substitution products, and R. Kissling on the chemical study of the latter. This number is highly technical and of value to laboratory workers on the analysis of foods.

Abt. V, Teil 2, Heft 6 is devoted to the methods of formulating medical statistics, written by F. Printzing. In it the statistician will find much of value.

Abt. V, Teil 3B, Heft 2 contains some articles on the functions of special organs. B. Aschner writes about the technic of experimental investigation of the hypophysis and midbrain, H. Peiper describes the method of extirpating the adrenals in different animals, W. Kolmer describes some experimental studies on the pineal body and S. Fränkel writes about the demonstration, estimation and production of the internal secretions of special organs and about their decomposition and synthesis. From the very nature of this work it is too technical for the physician.

THEILHABER'S FIFTIETH ANNIVERSARY

Beiträge zu Problemen der Gynäkologie und des Karzinoms. Festschrift zum 70. Geburtstag und 50 jährigen Doktorjubiläum Hofrat Dr. A. Theilhaber in München, gewidmet von Prof. Edelberg, Prof. Fichera, Dr. Galant, Prof. Grudew. Dr. D. A. Gudim-Lewkowitsch, Dr. L. Hirsch, Prof. v. Jaschke. Doz. A. Jordan, Prof. Kakuschkin, Prof. Liepmann, Geh.-Rat Opitz. Dr. Rieger, Dr. S. A. Selitzky, Dr. Felix A. Theilhaber, Dr. Wladimirsky, Dr. Fr. Wolff. Berlin: C. F. Pilger & Co., Medizin. Verlag. Pp. 205.

This *Festschrift* was published to celebrate the seventieth birthday of A. Theilhaber, the gynecologist, and the fiftieth anniversary of his activity in medicine. A short résumé of his medical writings is given. Opitz writes about the approved theories on the origin and curability of cancer. Edelberg contributes an article on cellular immunity and the spontaneous cure of cancer. Fichera reports on his oncological studies on cancer. Rieger discusses carcinoma and blood supply. Galant discusses gynecological questions of the day, such as gynecological psychotherapy, artificial impregnation, the Kielland forceps, gynecological pediology, cellular immunity of the sexual cells and impregnation, and the course of investigation and the advances in gynecology. Kakuschkin takes up the subject of eugenics and gynecology. F. A. Theilhaber gives a critical review of bloodletting. Wolff discusses the fundamental principles of vaccine therapy in gonorrhea of the female. Selitzky takes up the subject of the clinical application of normal horse serum and of Ringer's solution. Liepmann's subject is metropathy of the uterus. v. Jaschke discusses the subject of the symptomatology of retroverion flexion of the uterus. Hirsch describes the operative treatment of dysmenorrhea according to Theilhaber's method. Selitzky and Jordan each write about symmetrical dysmenorrheal dermatitis, a toxicosis of menstruation. Grusdew discusses relationship between the high position of the uterus and Hirschsprung's disease. Gudim-Lewkowitsch writes about uterine hemorrhages associated with the hemorrhagic diathesis and the dysfunction of the ovary. Wladimirsky discusses dermoid cysts of the ovary with fat balls. Theilhaber himself contributes an article on cellular immunity in its effect upon the occurrence and treatment of constitutional and infectious diseases. An extensive bibliography is appended.

TISSUE CULTURE

The Technic of Tissue Culture In Vitro. By T. S. P. Strangeways. Cambridge: W. Heffer and Sons, Ltd. 1924. Pp. 80.

For those who wish to attack the many problems help for which the possibility of growing mammalian tissues in plasma offers, this is a valuable and practical guide, and one which will enable the research worker to carry on a good deal of investigation without further information. It should be supplemented, however, by the reading of Rhoda Erdmann's *Praktikum,* which contains a great deal of information which this brief exposition does not.

Tissue Culture in Relation to Growth and Differentiation. T. S. P. Strangeways. Cambridge: W. Heffer and Sons, Ltd., 1924. Pp. 50.

This little book gives a survey of some of the facts which have been observed during the culture of tissues *in vitro.* It might well be a good deal more detailed than it is, although the author states that it is simply the elaboration of his notes for a series of lectures he delivered at Cambridge. Very little reference is made to the work of the Lewis in this country, or of Rhoda Erdmann in Germany. A good deal more evidence than Strangeways offers should be brought forward before the statement can be accepted that "cells growing *in vitro* after exposure to x ray are permanently modified, and that new types of cells can be experimentally produced which, throughout an indefinite number of generations, may be said to breed true."

Medicoliterary Notes.

Two illuminating articles of unusual significance to those interested in the prison and penal problem are published in the *Atlantic Monthly* for April and May. They are entitled The Pound of Flesh, and Justice, and are written by a woman of exceptional intelligence and culture sentenced to a term of "nineteen years of hard labor," who signs herself Alice Thornton.

* * *

A movement to establish many more playgrounds for the slum children of London has been started. It will be fostered by a new organization called the National Playing Fields Association, which has begun already its propaganda work.

* * *

Dr. Frederick F. Russell, general director of the International Health Board of the Rockefeller Foundation, recently returned to this country from a tour of the Holy Land, reports that the war in Palestine on the malaria carrying mosquito has been so effectively waged that the greater part of the population of cities has been freed from all danger of infection.

* * *

According to recent press reports, London is building a new medical centre comparable to that which New York is erecting at Broadway and 168th Street. The nucleus of this new institution is the New University College Hospital made possible by a gift from the Rockefeller Foundation donated last year. When the new hospital is

npleted, it will be one of the best equipped plants of kind in Great Britain. The buildings already include well known laboratory for scientific medicine, a matery hospital, and surgical wards of one hundred and enty beds. One of the most generous of the individual ıors has been Geoffrey E. Duveen, who has given the for a new Royal Ear, Nose and Throat Hospital.

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Boston will open in October a repertory theatre, which l be neither a state nor municipal institution, but a ic playhouse run by a quasipublic corporation. It proes to follow the example of Continental municipal atres in supplying to its patrons a varied and changing gram of dramatic entertainments based on the best terial from all countries. The Boston theatre will be exempt and so cannot be run for profit.

* * *

Every year about eight billion cigars are manufactured the United States, or about one for each resident to oke on Sundays and holidays. Even the imposing num- of cigarettes produced—sixty billion—means less than a day for each person, but the tobacco output also ludes one hundred and twenty million pounds of plug, million pounds of twist, and two hundred and fifty lion pounds of smoking tobacco. The surprise of the acco industry is that forty million pounds of snuff are l manufactured, although the habit was supposed to re passed. It means a consumption of nearly half a ınd per annum per capita. The tobacco imports besides luded nearly sixty million pounds of leaf and five million ınds of cigars and cigarettes.—*New York Times.*

* * *

The city of Buffalo has recently organized a Mental giene Council which is the outgrowth of the Committee Mental Hygiene of the Council of Social Agencies of t city.

* * *

The "dangers" to the theatrical profession from the adcasting of plays and other entertainments seems to as much in the lime light in Great Britain as in this ntry. A. N. M. writing for the *Manchester Guardian* ıs up the almost obvious conclusions of the discussion very much the same manner as has been done in the ited States. He writes: "All the protests in the world not prevent the encroachments of broadcasting upon the ma. These matters are not in the hands of sensitive ists who are jealous about their art. Broadcasting ıpanies are commercial companies, and they will not il because a number of contributors to the Playgoer's mposium think they are dangerous. We shall hear a d deal presently about the art of the broadcast play, possibly clever people will contrive to make something it. I don't think it can have any great effect upon more serious and talented of dramatists unless it be t they are hard up and the broadcasters bid high for ir degradation."

* * *

Bernard Shaw's play, *Saint Joan,* which was recently hdrawn after a start at the International Theatre in ris in deference to "certain clerical and patriotic susıibilities," has reopened at a very exclusive little playse called the Theâtre des Arts. The Russian company ducing it are reported to have spoken the lines with so ad an accent as to be at times unintelligible. Neverthe-, the play is pronounced a marked success, with nothing it to wound the most sensitive French patriot. The risians are particularly delighted with Shaw's portrait the ultra-British Earl of Warwick.

* * *

Robert Louis Stevenson's birthplace in Edinburgh at 8 ward Place will be opened by the Stevenson Club of nburgh as a memorial house in which his manuscripts other relics will be kept and exhibited for future erations. Contributions for a memorial fund to come the purchase of the house are being asked for.

* * *

A recent Epidemiological Report of the Health Section the League of Nations Secretariat shows that the llpox fatality rate increase is not confined to the United tes. In England, Spain, Switzerland, Algeria and Tunis re has been a marked increase in the prevalence of disease during the winter season. The report states "the gradual increase of the fatality suggests that a nge of type has taken place, as the fatality ratio is usually highest at the beginning of an epidemic, while the contrary has been the case here."

* * *

Recent books of interest to physicians are *The Challenge of Childhood,* by Dr. Ira S. Wile (Thomas Seltzer); *The Neuroses of Nations,* by C. E. Playne (Allen & Unwin, London); *Behaviorism,* by Dr. John B. Watson (The People's Institute, New York); *The Inheritance of Mental Diseases,* by Dr. Abraham Myerson (Williams & Wilkins Company); *Handbook of American Prisons,* prepared by the National Society of Penal Information (Putnam); *The Retarded Child: How to Help Him,* by Dr. Arnold Gesell (Public School Publishing Company); *Youth in Conflict,* by Miriam Van Waters (Republic Publishing Co.).

* * *

Denmark has recently recast its whole penal code. The new Bill of Punishments which is soon to go into effect abolishes legal practises that have been in vogue for hundreds of years. Capital punishment is abolished—it has not been enforced for nearly half a century—life imprisonment ceases to be a mandatory sentence even for first degree murder; it is imposed only for an attempt upon the life of a sovereign. The longest sentence that a judge can impose for other cases is one of eighteen years. Among crimes for which punishments are reduced are those against the safety of the State, against begging, petty larceny, and vagabondage. Penalties are increased for cruelty to animals, assaults upon women, and children, and for business frauds. New "crimes" are "public incitement to speculation" and "the making of incitement to emigration a business." Punishment is abolished for matrimonial infidelity, and under special circumstances exemption may be granted when one person kills another at the latter's request to end hopeless suffering or to fight against an incurable disease.

* * *

Novels announced for immediate publication by the George H. Doran Company are *Mayfair,* by Michael Arlen; *Wolf,* by Albert Payson Terhune; *Helen,* by Edward Lucas White; *Cruel Fellowship,* by Cyril Hume; and *Serena Blandish, or the Difficulty of Getting Married,* by "a Lady of Quality." Early in July Doubleday, Page & Co. will publish Joseph Conrad's posthumous novel, *Suspense,* in a de luxe edition limited to 377 copies. This is a story of Napoleon upon which Conrad was engaged in writing at the time of his death.

* * *

The new school of tropical medicine which Americans are building at San Juan, the capital of Porto Rico, will be ready for opening in the Fall. This school, while complete in itself, will be nucleus for other units. One of the principal objects will be the establishment and promotion of Panamerican friendship and interests. Although the causes and methods of treatment of malaria and hookworm are known, these diseases are still to be reckoned with in tropical regions, and there will be special departments in the new university for their study.

* * *

The April number of the *Harvard Advocate* is full of clever fun, for it is a parody issue, the cover of which imitates that of our radical friend, *The Dial.* The May issue of the *Forum* is one of unusual interest. Arthur Symons, the English critic, undertakes to name what are in his opinion the fifteen "finest novels." There is a debate between William L. Rogers and Tasker Howard Bliss on Shall America Arm? and another on America and Roman Catholicism, third in the series; the second of Jules Bois's articles on Religions of America—Theosophy; and some good stories.

* * *

Pamphlets recently issued by the National Committee for Mental Hygiene are A Plea for Greater Frankness in Dealing with Those Who Are Mentally Sick, by Ransom H. Sartwell, M.D.; Dispensary Contacts with Delinquent Trends in Children, by Esther L. Richards, M.D.; Psychiatric Treatment and Probation, by Bernard Glueck, M.D.; Feeblemindedness, by Walter E. Fernald, M.D.; Suggestions for Reading in Mental Hygiene, by Kathleen Ormsby and Frankwood E. Williams, M.D.; Some Undesirable Habits in Children and Suggestions as to Treatment, by Jessie Taft, Ph.D. and others. Any of these pamphlets may be obtained for a nominal sum from the National Committee for Mental Hygiene, 370 Seventh Avenue, New York.

Abstracts from Current Literature

BLOOD AND LYMPH GLANDS

Further Studies on Blood Grouping.—C. G. Guthrie and J. F. Pessel (*Bulletin of the Johns Hopkins Hospital,* April, 1924) confirm and extend their earlier observations concerning the existence in the human blood of at least three isoagglutinins and the corresponding isoagglutinogens: A fourth isoagglutinin (D) has been demonstrated in the serum of one member of group II in association with isoagglutinin A. Isoagglutinin D was not found in the serum of any other blood in the series including one member of group I, another member of group II, one member of group III, and three members of group IV. The corresponding isoagglutinogen (d) has been demonstrated in the red cells of one member of group III. It was not present in the six other bloods in the series, but has since been found in the erythrocytes of six additional members of group III in association with isoagglutinogen a. The presence of isoagglutinogen c in association with isoagglutinogens a and b has been demonstrated in the red cells of three members of group I. In an earlier investigation two members of this group were found whose red cells contained isoagglutinogens a and b, but not isoagglutinogen c. A fifth isoagglutinin (Q) was found in the serum of one member of group IV; it was quite distinct from agglutinins A, B, C, and D. The corresponding isoagglutinogen (q) was present in the red cells of another member of group IV. Neither this agglutinin nor this agglutinogen were found in any other blood in the series. This agglutinin (Q) was present in lower concentration than the others and therefore required a lower temperature for its demonstration. Its action occurred within one of the four accepted groups rather than between these groups, but in the quality and specificity of the agglutinin produced, it was in no way inferior to the others.

Leucocytic Picture in Catarrhal Jaundice (Cholangitis).—Ethel Thewlis and William S. Middleton (*American Journal of the Medical Sciences,* January, 1925) present this summary: Leucopenia is an almost constant blood finding in uncomplicated catarrhal cholangitis. In a certain percentage of cases it may precede the appearance of the jaundice. In cases followed long enough a definite postfebrile, reactive leucocytosis is remarked. The polymorphonuclear neutrophiles suffer more than any other white blood element in the primary depression. This disproportionate decrease of the neutrophiles leads to a relative lymphocytosis, but the actual number of these elements is decreased, as a rule. The large mononuclear cells alone appear to be constantly increased in catarrhal jaundice. In moderate cases a return to the normal numerical and differential counts occurs within two weeks. From a practical viewpoint these data should serve as important diagnostic criteria. Prognosis in catarrhal jaundice may be guided by the degree of the leucopenia and the trend of the leucocytic curve. The degree of leucocytic depression is frequently in direct ratio to the severity of the underlying condition. Furthermore, the lowering of resistance incident to a decrease in the leuoccytes in catarrhal cholangitis must impress the practitioner with the necessity for the protection of such persons from exposure to infectious disease, until a normal leucocytic level has been reëstablished.

Shortened Bleeding Time in Hemorrhagic Disorders.—P. Emile-Weil (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* July 10, 1924) points out that in a few cases of hepatic disease with hemorrhagic manifestations or of chronic hemorrhagic diathesis the bleeding time may be shortened instead of increased. Aside from these conditions a shortened bleeding time is met with only in myxedema and hypothyroid states. One of the author's cases was severe chronic hemorrhagic diathesis with purpura, bleeding gums and epistaxis so copious as to threaten life. Yet numerous incisions in the ears would not yield a drop of blood. Five hours later, however, they began to bleed and continued to do so for a long time, showing clearly the existence of a blood dyscrasia. The coagulation time was normal, but the clot did not retract. Another case was cerebral hemorrhage; the bleeding time is regulary increased in such cases, but in this patient it showed two and a half, one and two minutes. In a third case the patient had cardiorenal disease with azotemia, hemoptys and epistaxis. The bleeding time showed three and a ha one and a half and one minute. Variations of the bleedi time at different times in the same patient are even mo significant than the actual increase or decrease of bleedi time. They also show the importance of the associat vasomotor factor in the production or continuation of t hemorrhages.

Blood Platelets in Anemias and Acute Disease Their Number and Morphology.—G. J. Crawfo (*Lancet,* September 20, 1924) draws the following concl sions: A considerable diminution in the platelet count m occur in pernicious anemia, lymphatic leucemia, and purpu hemorrhagica, whereas an increase in these elements of t blood is observed in lymphadenoma and in myelogeno leucemia. In the cases of secondary anemia examin normal or slightly increased counts were obtained. Gener speaking, an increase of platelets would seem to be associat with a hyperactivity of the bone marrow, and vice ver suggesting that the platelet originates in this portion of t hemopoietic system. In one case examined, splenecto resulted in a considerable increase in the platelet cou An increased bleeding time is associated with a low platel count. No correlation could be made out between the blee ing time and the coagulation time.

Distribution of Phosphorus Compounds in the Blo in Tuberculosis.—K. Lucille McCluskey (*Journal of La oratory and Clinical Medicine,* March, 1925), because of t important rôle of phosphorus in the metabolism of t tubercle bacillus, studied the distribution of phosphorus co pounds in the cell and plasma, and attempted to ascert any tendencies toward progressive changes concomitant wi the various stages of tuberculosis. The results obtain showed the following: A disturbance of phosphorus meta olism in tuberculosis; a decrease in lecithin content of bo the cell and the plasma, with a simultaneous increase in ac soluble phosphorus, represents a grave prognosis, while t opposite indicates a favorable condition. The size of t red cell is decreased in tuberculosis, except in the first stag and the volume per cent. of cells is decidedly decreased the far advanced exudative type. The sum of the lecit and acid soluble fractions is equal to the total phosphor except in group I, terminal stage, in which the total pho phorus is greater than the sum of these two fractio This additional phosphorus fraction is confined to the c and represents a group not soluble in ether alcohol trichloracetic acid.

Uric Acid Levels in the Blood of Man and Animals. A. T. Weathers and H. C. Sweany (*Journal of Laborato and Clinical Medicine,* March, 1925) compare the new Fo and new Benedict methods for determining uric acid the blood of man. Most animals have a small amount uric acid in the blood as determined by these newer techni Very accurate determinations of uric acid can be made 0.5 to 1 c.c of blood. The normal level of uric acid shou be raised from 1 to 3 mm. to 1 to 4 mg. of uric acid 100 c.c. The uric acid in tuberculosis was found to about normal in all phases of the disease, with a tendency decrease as the disease became far advanced. The tw methods were found to yield the same results, and ea gave a fairly accurate recovery of uric acid added to huma and animal bloods. Polyphenols and aminoacids in quan ties double those found in normal bloods did not make appreciable error in uric acid determination by these metho

Leucocytic Phase of Hemoclastic Shock.—William Middleton (*Journal of Laboratory and Clinical Medici* March, 1925) reports observations on three cases in wh the control of whole milk was kept at 200 gm., but t quantity of the component elements was in each case divi by two. Casein, butterfat, and lactose were used in th experiments in the amounts found in 100 gm. of whole mil White cell counts were taken every twenty minutes a t the ingestion of the element to be tested over a period three hours. An alimentary leucocytosis did not follow t ingestion of whole milk. The time of the appearance the leucocytic depression was inconstant, as was also i degree. Three successive falls in the leucocyte curve we traced in each instance. Contrary to the results of Wid

sein showed a true shock response in only one of the two ses studied. The curves for whey, containing the other otein constituent of milk, were bizarre, and incapable of conciliation with their parent curves. Butterfat, on the ıer hand, showed a resemblance to the whole milk curves two of three cases. Lactose significantly conforms most sely of all the studied elements of milk to the basic whole lk curve. The occurrence of a typical reaction on the gestion of water in one case casts doubt on the significance the organic factor, protein or otherwise, in the causation the blood changes. The degree of leucocytic fall with reduced proportions of the elements of milk as comred with the basic curves of whole milk is surprising in ny instances. The author draws no conclusions from se few instances, but says that the indication is clear t a protein element is not essential for the production of noclastic shock in cases of catarrhal cholangitis.

Comparison of the Effects of X Ray and Dry Heat on ıtibody Formation.—James B. Murphy and Ernest ırm (*Journal of Experimental Medicine,* February, 1925) nfirm and extend the observations of Hektoen and others t x ray in large doses given before and during the imnizing process retards definitely the production of such ibodies as precipitins, bacterial agglutinins, and protec- antibodies, for rabbits receiving sufficient doses of x ray reduce the amount of their lymphoid tissue without nage to the bone marrow showed a definite reduction of se antibodies. The evidence pointing to the lymphoid ue as the manufacturer of antibodies is strengthened by experiments reported in which an animal's ability to m such bodies was greatly increased by the stimulation the lymphoid tissues by dry heat.

Allergic Irritability.—Anaphylaxis in the Guineapig as fected by the Inheritance. Paul A. Lewis and Dorothy omis (*Journal of Experimental Medicine,* March, 1925) nd that the regularity with which a series of guineapigs four different families reacted in classical anaphylaxis periments with horse serum as antigen varied from family family. The order, in the small series studied, happened follow the order of resistance to tuberculosis. They think t a difference in allergic irritability with reference to phylaxis, resting on the basis of family and hence of eritance, is at the least very strongly suggested by the ılts of the experiments described.

nfluence of the "Diaplyte" Antigen of Dreyer on berculosis of the Guineapig.—Jacques J. Bronfenbren- and Elmer L. Straub (*Journal of Experimental Medi-*, February, 1925) prepared a "diaplyte" antigen accord- to the method of Dreyer, and used guineapigs to test its apeutic value. The gross autopsy findings yielded no lence of differences between the condition of animals ted with antigen and the untreated controls. In fact, effect of treatment was to accelerate the fatal issue, er than to delay it.

ffect of High Fat Diets on the Content of Uric Acid Blood.—Victor John Harding, Kathleen Drew Allin, he Alfred Eagles, and H. B. Van Wyck (*Journal of ogical Chemistry,* February, 1925) observed that high diets producing a ketosis invariably raise the uric acid ent of the blood, and that often the rise in uric acid is mpanied by an increase in the nonprotein nitrogen h is not attributable to an augmentation of the blood . This uric acid increase may be brought down to its nal level by a carbohydrate or protein diet. The inse can be partly accounted for by a decreased blood me with a consequent decreased elimination. In fifty cent. of the cases, however, such an explanation would ar insufficent to account for the great increase in the d uric acid.

asma Lipoids in Experimental Anemia.—W. R. r (*Journal of Biological Chemistry,* February, 1925) d that the weights of total fatty acids, combined in ous forms and free, average about thirteen per cent. r in anemic animals than in the normals, and the total ponifiable matter (mainly cholesterol) about eight per higher in the anemics. The iodine values of the fatty average about thirteen per cent. higher in the anemic als. The high weight for fatty acids occurs only in ecithin and first two ester fractions; in the others the ıts are below the normal. The significance of the increase saturated acids is difficult to determine. Bloor states in ssing his results that the blood corpuscles have been found to take part in certain phases of fat metabolism, and it is possible that the diminished number of corpuscles in anemia is the cause of the phenomenon. However, the blood forming organs, such as the marrow of the long bones, are undoubtedly stimulated by the bleeding, and the suggestion that has been offered for the great increase in amount and degree of unsaturation of the blood lipoids, which is observed after repeated hemorrhages in rabbits, may apply here, i. e., the forcing out of the fat marrow by the blood forming red marrow. It is emphasized that the increase of unsaturated acids is the result and not the cause of the anemia.

Effect of Intravenous Administration of Sodium Citrate in Two Cases of Hemophilia.—Lee D. Cady and E. Lee Shrader (*Journal of Laboratory and Clinical Medicine,* June, 1924) noted certain definite symptoms in two cases of hemophilia if the sodium citrate was injected too rapidly; the only symptoms that were allowed to occur being subjective. At first after intravenous injections of sodium citrate there may be an increase in the clotting time for a few hours, but this is followed by a decrease. Repeated injections do not seem to have the beneficial effects of single injections. The platelets were diminished immediately after the injections, and slowly returned to normal. Intravenous administration of sodium citrate of hemophilic patients appears to be harmless and not contraindicated when not repeated too frequently.

Pernicious Anemia and Renal Insufficiency.—Ralph H. Major (*Bulletin of the Johns Hopkins Hospital,* December, 1924) found in a small series of pernicious anemia patients with a gastric anacidity, a high color index, a high volume index, and a typical clinical appearance, that the urine showed such a low excretion of chlorides as to suggest a retention. The patients were then given salol coated sodium chloride tablets in doses varying from six to twenty gm. a day. This produced no increase in the excretion of chlorides, and they had no evidence of renal disease, and two of the patients had no albuminuria. These findings suggest the possibility that the retention of chlorides in pernicious anemia is not due to renal disease, but bears some analogy to the retention seen in lobar pneumonia and in certain cases of intestinal obstruction.

Use of Desiccated Red Bone Marrow and Spleen in the Treatment of Anemia.—William Thalhimer (*Journal of Laboratory and Clinical Medicine,* November, 1924) gave practically all the patients treated with spleen marrow compound three five grain capsules a day. Of forty six patients with secondary anemia, forty-one showed an increase in the circulating erythrocytes and hemoglobin. In four patients with pernicious anemia the administration of the capsules caused a prompt decrease in both hemoglobin and circulating erythrocytes; therefore the preparation should not be used in this condition. One patient with Von Jaksch's anemia showed both a marked clinical improvement and an improved blood picture. In one patient with hemolytic icterus, whose spleen had been removed eleven months previously, hematopoiesis was stimulated by the preparation. Patients with pulmonary tuberculosis responded favorably to this treatment.

Tuberculous Cervical Lymph Glands.—J. M. Hanford (*Annals of Surgery,* December, 1924) offers the following conclusions to his preliminary report upon the subject. Operation is indicated in a large number of patients with tuberculous cervical lymph glands. It is impossible to make rules covering all the combinations of lesions and regions which may be seen in patients with more or less extensive involvement. An adaption of the main principles is worked out for every patient. Early removal of all tuberculous tissue is the ideal; but it must be tempered with an eye to the ultimate appearance of the neck and with safety to the patient and to the important structures. After time and conservative treatment have done their work, a later removal, if needed, is always worthy of consideration. The results with conservative treatment (including the simpler operations) are so good that only those radical operations are done which are relatively easy and devoid of nerve and vein damage. The more extensive operations are relatively safe in the submental, submaxillary, subangular, posterior auricular, suboccipital, lower deep cervical regions, and in that of the axillary glands. Damage to the nerve to the lower lip is surprisingly frequent in the submental and submaxillary regions. Damage to the accessory nerve is not infrequent in the subangular region.

In the subangular region early complete excision is recommended. In the subangular, deep mastoid, suboccipital, mid part of posterior superficial chain of glands, and in the lower deep cervical regions complete excision of the whole mass of disease is replaced by the safer but less ideal procedures as needed according to the lesions Operative procedures are but a part of the whole plan of treatment and may be indicated at any period, depending upon the general and the local conditions.

Injury and White Blood Cell in Inflammation.—H. A. Abramson (*American Journal of Medical Sciences,* May, 1924) offers a theory that one of the forces guiding the white blood cell to a point of injury followed by an inflammatory process may be the current of inquiry (demarcation current). With nonpolarizable electrodes under stated conditions, small lymphocytes migrate toward the anode which may apparently be compared to an injured tissue focus where inflammation has set up. Polymorphonuclear leucocytes under the same conditions do not consistently go toward one pole or the other. The probable cause of their failure is discussed. The speed of fifteen microns a minute manifested by small lymphocytes was the same whether freshly drawn blood cells were studied, or those taken from defibrinated blood kept on ice up to thirty hours. Little if any ameboid motion was observed during lymphocytic migration. Those tissues which respond most easily with the picture of inflammation to injury, should have the greatest currents of injury, thus correlating the view expressed with the pathological processes. The mechanical and chemical makeup of tissues is stressed as a deciding factor in ease of production of the picture of inflammation.

Reciprocal Relationship of Chlorides and Glucose in the Blood.—W. W. Herrick (*Journal of Laboratory and Clinical Medicine,* April, 1924) reports a fairly constant reciprocal relation between the concentration of glucose and the chlorides in the blood under the conditions of the ordinary glucose tolerance test in a fasting patient. The simplest and most attractive explanation offered for this behavior of the chlorides in the presence of increasing concentration of other crystalloids in the blood is that, in an attempt on the part of the body to maintain its fluids in osmotic balance, the chlorides are forced out. This might be by excretion or by redistribution, that is, by increased concentration in other tissues.

Tissue Resistance and the Cause of Permanent Acquired Immunity.—S. Nukada and T. Matsuzaki (*Journal of Experimental Medicine,* November, 1924) have demonstrated experimentally that the tissue cells of the hearts of typhoid immune animals are altered in such a way that their resisting power is increased specifically against toxic products of typhoid bacilli. The acquired increase of resisting power is specific. The authors maintain that permanent acquired immunity, at least in typhoid, instead of being principally caused by antibodies in the blood, is due rather to a lasting specific increase of resisting power acquired by the tissue cells against the toxic products of bacteria. This seems to hold true not only with typhoid, but also with other infectious diseases, in which one attack causes lasting immunity.

MALIGNANCY

Principles of Treatment in the Radiotherapeutics of Cancer.—Francis Hernaman-Johnson (*Lancet,* September 27, 1924) summarizes some fundamental principles and also his personal views, based upon what actually happens in the living subject, as follows:

1. The wave length most suitable for any given type of growth can be found only by clinical observation.

2. If an injury is inflicted by rays of a given wave length, the lesion may be cured or mitigated by rays of a widely different wave length.

3. Malignant tumors should be regarded from a dynamic and not from a static viewpoint. The microscope does not enable us to say that any two tumors are really alike.

4. The still healthy parts in the neighborhood of a tumor play a vital part in the success of any theraptutic measure.

5. When intensive dosage is used, the amount of radiation which is concentrated upon a tumor should not exceed the maximum consistent with the production of a healthy reaction in the surrounding tissues.

6. The socalled danger of a stimulating dose is a bogey. If the danger were real it would forbid the treatment by x rays of any but the earliest growths.

7. The intensive method should rarely be used to rend a case operable, and never as a prophylactic after operatio For this purpose, and as a palliative in hopeless cases, t small divided dose is alone suitable.

Gallstones and Cancer of the Gallbladder.—As a resu of his experimental study on animals, Archibald Leit (*British Medical Journal,* September 13, 1924) comes the conclusion that, in the human subject, gallstones a capable of causing cancer of the gallbladder. Freely a mitting that they do so in a comparatively small proporti of cases, it may be admitted that in some subjects there is natural resistance to carcinogenic agents, just as there is natural resistance to pathogenic organisms, and, learni from previous experiments that similar tumors may produced by wholly dissimilar agents, the carcinomata the gallbladder which are found in the absence of gallston may be accounted for as being due to some other cau agent or agents not yet identified.

Fibroid Gumma (Juxtaarticular Nodules of Lutz-Jea selme).—Sigmund S. Greenbaum (*Journal of Laborato and Clinical Medicine,* March, 1925). Because of the rec observation of a typical example in a syphilitic, who h a primary lesion eleven years previously and who presen symmetrically on the elbows, on the right knee and the left palm, very hard hypodermic and dermohypoderm nodules of six to eight years' duration, and because of t apparent rarity and the lack of uniformity regarding th etiological significance, a clinical review of this combin syphilitic fibrogummatous lesion and its relation to t fibromata and the juxtaarticular nodules, so common the orient and tropical countries, is presented by Greenbau The case is a typical example of a condition observed Lutz in 1891 and later by Jeanselme.

Resistance to Spontaneous Mouse Cancer Induc by Injections of Oleic Acid.—Waro Nakahara (*Jour of Experimental Medicine,* March, 1925) used oleic a in this work because the range of doses effective agai transplanted cancer is wider than in the other unsatura fatty acids which have been tested. The object of work was to determine first the effect of oleic acid inj tions on the frequency of recurrence after operative moval of spontaneous mouse cancer, and second, the eff on the incidence of takes of autoplastic cancer grafts. effect of oleic acid injections on the postoperative clin course was a reduction of local recurrences, of new prim tumors, of metastases, and of total recurrence of disea Sixty-two per cent. of the treated animals showed comp freedom from the tumors, as against twelve per cent. the controls. The average postoperative longevity in treated mice was 147 days, which was forty-nine d longer than in the control series. It therefore seems t the resistance of mice to spontaneous neoplastic disea can be increased by means of oleic acid.

Nature of Cancer.—G. W. Crile (*Annals of Surg* September, 1924), on the basis that the processes of division in cancer are analogous to the processes of division in fertilized cells, reports certain biophysical searches and points out certain pertinent facts tending show that cancer falls within the domain of electrochem or bipolar theory which applies to normal living proces Various suggestive analogies between cancer and pyog infections are drawn, to aid in forming the basis of a ment. Up to the present time, the successful findings these researches suggest that the whole story of ca may ultimately be derived from conductivity and capa measurements. The author states that the theory ha least this advantage, that it has been formulated developed on the basis of exact mathematical formulas physical laws and in consequence can the more readil disproved if not true, and if true can be the more ea defended.

Mikulicz Operation for Cancer of Sigmoid.—C. Mayo and W. Walters (*Surgery, Gynecology and Obstet* July, 2924) reprint W. J. Mayo's description of this op tion, adding certain modifications of their own, particul in regard to the objection that in the original opera the bowel was allowed to heal in the wound before be opened. It has been their practice in the clinic to ren the portion of the bowel containing the tumor at primary operation whenever it could not be elevated ab the incision, or its circulation was so seriously interfe with that gangrene was to be expected, as it was no

certain of these cases that septic thrombi progressed eeply, resulting in peritonitis. Also, if the lower fragment very short, the growth is cut away at once. The two nds of the bowel are then clamped, the clamp on the ower part being used as a temporary elevator, and left a place until it comes away itself, by which time the ower fragment has attached itself with sufficient strength o remain in the lower angle of the wound. In a number f instances in which the cancer was very low in the igmoid, the entire rectum was loosened up to the levator ni muscle, and by the forceps method, the upper end of ne rectum was maintained in position, the peritoneum of ne lower pelvis being obliterated by sutures, and a pack f vaseline iodoform gauze introduced about the forceps. he space in the hollow of the sacrum was drained by right lateral stab wound. An opening can be made in ne proximal fragment above the clamp at any time to elieve the pressure of gas, and so forth. Ultimate closure f the sigmoid ends is made extraperitoneally, or if necesary, by the tube method of Balfour.

Carcinoma of the Colon.—C. H. Peck (*Annals of Surery,* September, 1924) believes that cancer of the colon xcluding the rectum offers a relatively high rate of perability, and a percentage of radical cures which comares favorably with that of malignant disease in other rgans. Growths of the cecum, and right colon, including he right part of the transverse colon, are suitable for a ne stage resection with immediate anastomosis by suture. he operative mortality should be relatively low. Left olon growths are more safely resected by the two stage Mikulicz method.

Multiple Foci in Cancer of Colon.—R. T. Miller, Jr. *Annals of Surgery,* September, 1924) presents ample evience to show that in a practical sense we must recognize hat cancer of the colon may occur as multiple primary esions, that an entirely similar picture may be produced y tumors which developed secondarily, and that polyposis f the colon has a tendency to malignant degeneration.

Anorectal Cancer.—S. G. Gant (*American Journal of Surgery,* September, 1924) pleads for the substitution of erineal and vaginal extirpation for Kraske's and the ombined operations with permanent colostomy in the reatment of anorectal cancer, on the following grounds:

Benefits derived from sacral excision are more than ounterbalanced by its many disadvantages, since Kraske's peration is prolonged and difficult, is accompanied by free emorrhage, induces decisive immediate and subsequent hock, is responsible for a higher mortality than perineal nd vaginal excision; lung and kidney complications from ther are frequent; the patient, if he survives, is compelled o remain in the hospital for weeks owing to the extent nd nature of the wound, which often becomes infected nd breaks down partially or throughout; the removal of one necessitates a sacral anus that prevents the patient sing the toilet normally, destroys pelvic support resulting n slight or extensive sigmoid al procidentia, injures nerves ontrolling rectovesical musculature causing fecal incontience, is sometimes followed by necrosis, leaving of irriating bone spicule, a hypersensitive sacrum or painful scar nd is responsible for a noncontrollable sacral anus that requently requires dilating to prevent the opening from ecoming strictured through contraction of surrounding car tissue.

The benefits said to accrue from the combined operation nethod are more than counterbalanced by the high morality of the procedure, which is four times that of perineal nd vaginal excision, the dangerous complications that ccompany or follow it and the permanent artificial anus hat is left to the disgust of the patient.

Briefly enumerated, other serious disadvantages of the ombined method are: The operation is accompanied by evere shock; it is unsuited to obese and debilitated atients; it requires twice as much time to perform as erineal or vaginal extirpation; extensive manipulation of bdominal viscera in search for diseased glands and organs s occasionally responsible for paralytic ileus; ureters, bladder and iliac vessels may be traumatized or seriously njured; death from hernia has ensued where the gut xtruded through an aperture in the closed pelvic periioneum; local recurrence is as frequent as following erineal or vaginal extirpation; and heart, lung, kidney nd bladder complications resulting in death or prolonged onvalescence are common.

Experimental Production of Mammary Carcinoma in Rabbits.—Katsusaburo Yamagiwa and Koschiro Murayama (*Journal of Cancer Research,* April, 1924) have produced twenty-three cases of cancroid and adenocancroid resembling that observed in man, in the past five years during the course of experiments on 188 animals. The epitheliomata were produced by injection of liquid tar extract, pure tar, mixture of tar and lanolin, liquid paraffin containing tar, olive oil, or liquid paraffin, in the doses of from 0.3 to 0.5 c.c., into the mammary glands; this injection was made once or twice a month. Animals dying after one or two injections were excluded. The development of epithelioma in 12.23 per cent. of the animals injected is considered a high average, especially taking into consideration the fact that spontaneous mammary carcinoma seems to be unusual.

Fibroma of Abdominal Wall.—M. J. Stewart and T. B. Mouat (*British Journal of Surgery,* October, 1924) consider this complication from all angles, and from a series of cases find that fibroma of the abdonimal wall is a simple fibrous tissue tumour arising in the musculoaponeurotic structures of the anterior abdominal wall, especially below the level of the umbilicus, and tending to infiltrate the muscle in which it lies. It is met with in women who have borne children to the extent of eighty per cent. of the reported cases, and it occasionally occurs in the scars of old hernial and other abdominal operation wounds. In other cases there is a history of local injury. A traumatic theory of origin seems reasonable, and the physiological trauma of labor would appear to be of special importance. The infrequency of the condition points to the presence of some additional unknown factor, which, in the absence of more accurate knowledge, may be termed individual predisposition. A peculiar change in the striped muscle fibres enclosed in the growth is described. It appears to be a process of dedifferentiation and results in the formation of multinucleated plasmodial masses resembling foreign body giant cells. Fibromata of the abdominal wall are usually of slow growth in the earlier stages, but with the advent of mucoid or myxomatous change a rapid increase in size may occur. They do not undergo metastasis nor do they endanger life, but there is no evidence that they ever disappear spontaneously. Treatment should be early and complete removal, with resection of a margin of healthy tissue wherever muscle, fascia, or peritoneum is invaded by or adherent to the growth. Recurrence means incomplete resection and demands a more radical operation. There is no evidence that sarcomatous metamorphosis ever occurs.

Pseudomyxoma Peritonei.—E. Ries (*Surgery, Gynecology and Obstetrics,* November, 1924) reports that pseudomyxoma peritonei is a secondary condition due to the escape of gelatinous material from a primary tumor. This tumor arises in the ovaries or in the appendix or both or rarely in other organs. The ovarian tumors are always pseudomucinous kystomata in their entirety or at least partially. The appendices from which pseudomyxoma peritonei starts are always more or less cystic, often show diverticula, and may contain papillomatous tumors. The operative treatment is successful in proportion to the completeness of removal of the original tumors and the pseudomyxoma peritonei. Every case of pseudomyxoma peritonei, especially in the female, requires investigation of the appendix and its removal. The chemistry of the gelatinous masses deserves further study with proper attention to the sources of the colloid material. The coexistence of ovarian tumor with appendiceal cyst in pseudomyxoma peritonei is a frequent finding. There is at present no evidence of anything more than accidental coexistence of the two conditions.

Fibrosarcoma of the Transverse Colon.—F. W. Rankin and J. C. Crager (*Surgery, Gynecology and Obstetrics,* December, 1924) assert that the mortality in all types of operation which formerly was as high as fifty per cent., but which under modern technique has been reduced to approximately ten per cent., will not be found to be decreased with a Mikulicz operation unless some other procedure in addition is adopted. We have tried the application of two stages of this procedure in one, doing the operation between clamps, removing the bowel segment with a cautery and leaving the bowel at the site of operation obstructed for a number of days. Supplementing this type of retention with an ileostomy about sixteen inches from the ileocecal coil, is a valuable adjunct toward reducing the untoward postoperative symptoms by draining the toxic products of the small bowel. The steps of the operation are simple.

MEDICAL JOURNAL AND RECORD

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Medicolegal Notes.

LIABILITY FOR TORTIOUS ACTS OF EMPLOYEE OF STATE UNIVERSITY'S INFIRMARY—IMMUNITY OF UNIVERSITY

The California District Court of Appeal, First District, holds, Davie v. Board of Regents, University of California, *227* Pac., 243, (rehearing denied by Supreme Court), that the maintenance by a state university, of an infirmary for the exclusive use of its students, conducted by it for the sole purpose of safeguarding and protecting the health of the student body, is a governmental function, and the university is not liable for the tortious acts of its employees. Being in no sense an organization for profit, the imposition of a small fee did not convert the governmental function into a proprietary one. The court says: "The reason for the rule that the policy of the law denies liability of a state or municipality for negligence of its servants and physicians is that such an activity being a governmental agency, to permit such liability would result in enormous public burdens."

The university had the power to establish and maintain the infirmary under article 9, §9, of the state Constitution, providing that the "corporation shall also have all the powers necessary or convenient for the effective administration of its trust."

The same court holds, however, Davie v. Regents of University of California et al, *227* Pac., 247, that this immunity does not extend to and cover a physician acting in the course of his employment as an agent of the university. The court says: "The principle which protects the regents is inapplicable to him. Where wrongs are done to individuals by those who are the servants of the government those injured are not remedyless, as such servants or employees may be sued the same as other persons for torts which they have committed."

QUESTION OF MORAL TURPITUDE IN PRESCRIBING NARCOTICS

The Tennessee Supreme Court holds, State Board of Medical Examiners v. Friedman, 263 S. W., 75, that, although a license to practice medicine once issued does not constitute a binding and valid contract with the state, or confer upon the holder of the license a vested right, the right to practice medicine is a property right, of which one cannot be illegally deprived.

It is held that the state board of medical examiners cannot revoke a physician's license on the ground that he had been convicted of an offense involving "moral turpitude" within the meaning of section 16, subsection 6, of Tennessee Acts 1919, c. 105, solely because he had been convicted of a violation of the Harrison Anti-Narcotic Act, although violation of the act constitutes a felony, since the mere violation of a revenue act may not in and of itself constitute "moral turpitude." By chapter 105 of the Acts of 1919 it is made pe missible for any physician in the state of Tennessee to pr scribe as much as eight grains of morphine per day to a one patient. It cannot, therefore, be said that prescribi morphine in considerable quantities is an act involving "mor turpitude," or even an illegal act in that state.

The court, however, thought it "is conceivable th there might be a conviction under the Harrison Act whic would show that the convicted physician had been guilty acts involving 'moral turpitude' when he violated the feder statute in question.

"Thus, suppose it should be shown that the convicte physician was in fact a mere drug peddler, preying on t necessities of the unfortunate class known as 'drug addict The record of the conviction, in such a case, might indica a high degree of 'moral turpitude.'"

On behalf of the state board it was claimed that the pre ent case was one of this nature. The original bill in the su was filed to review the action of the state board of medic examiners in revoking complainant's license to practice med cine, and to compel his reinstatement as a practitioner. T board demurred to the bill on various grounds, and the cha cellor overruled the demurrer. The board stood on the demurrer, and decree was entered for the complainant, fro which the board appealed. The Supreme Court is of opini that cases of this nature should not be decided on demurre and remanded the case for answer and proof on the questi of "moral turpitude," in accordance with the principles state

"DISCRETION" OF EXAMINING BOARDS IN LICENSING APPLICANTS

The Michigan Supreme Court holds, Wilson v. Michig State Board of Registration in Medicine, 199 N. W., 6 that the exercise of sound discretion on the facts submitt to them, which is vested in such a board as defendant, do not include the exercise of arbitrary will. In a mandam suit to compel the issue of a certificate of registration plaintiff under Comp. Laws 1915, §67226, the court fou that the defendant, in its answer to an order to show cau why writ should not be issue, "sets up no fact or set of fac upon which it exercised such discretion, if it did so, and its answer gives no grounds or reason for such refusa but states only legal conclusions without any facts up which to base them. The court said: "If such an answer sufficient to our order to show cause, then the actions such boards possessed of discretionary power are immu from judicial inquiry. All that they would be required say is that they have used their discretion without givi any reason for their decision or state any facts which the basis of their finding; they could register or refuse register without giving any reason at all for their acti they could at will register one applicant and reject anoth possessed of the same qualifications."

CAUSE OF INJURY FOR JURY WHERE EXPERT MEDICAL TESTIMONY CONFLICTS

The Nebraska Supreme Court holds, Culver v. Uni Pacific R. R. Co., 199 N. W., 794, that where the opinion medical experts as to the cause which has produced a lesi of the spinal cord, causing partial paralysis, is in decid conflict, the question whether the injury to the cord was t result of external accident or was the result of disease one for the jury, there being sufficient evidence to supp a verdict based upon either theory.

EXPERT OPINION AS TO CONSEQUENCES OF INJURY BASED CONJECTURE HELD INADMISSIBLE

The Illinois Appellate Court holds, O'Donnell v. Snyd 231 Ill. App., 581, that it was error to permit medical e pert witnesses for the plaintiff in a personal injury actio testify as to probable and possible results from the inju where their testimony fell far short of the reasonable ce tainty as to future consequences required by law, and w apparently based on conjecture.

CHIROPRACTORS MUST HAVE LICENSE UNDER PENNSYLVAN STATUTE

The Pennsylvania Superior Court holds, Commonweal v. Martindell, 82 Pa. Superior Ct., 417, that a person wh practises chiropractics practises medicine and surgery defined in the Act of June 3, 1911, P. L., 639, as amend by the Act of April 20, 1921, P. L., 158, and is proper convicted of a violation of the statute if he practises h profession without obtaining a license. A contention th he made no diagnosis was rejected as a contradiction terms, since he, like others, must begin by a diagnosis.

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The Problem Method of Medical Teaching

Its Advantages and Objections

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At no time does one concentrate so thoroughly on the available data as when endeavoring to attain the solution of an absorbing problem; and at no time does one so take cognizance of pertinent facts as when equipping oneself to meet a definite situation. For example, consider the orthopedic surgeon who is faced with the task of correcting a deformity different in nature from any other he has heretofore encountered. Carefully and minutely he studies the case before him, noting the various stresses that have led up to, or that now maintain, the present strain and deformity; studiedly he compares the abnormal condition with the structures forming the normal; not unlikely he visits the nearest anatomical laboratory and painstakingly dissects ligament, muscle, and bone that he may be adequately sure what tensions at this point, or what relaxations from that area, will produce a given effect. He may next go into the pathological museum to study whatever related sequences of malformation have come to the attention of that department; he may confer with the physiologist regarding the mechanics of normal functioning of the part being studied, and as to what might be expected from partial restorations of deformed structures. He assiduously consults the literature of anatomy, pathology, and orthopedics, seeking to ascertain all correlated information. And all the time foremost in mind he has the problem of suitable correction of a particular deformity; that is the central idea around which is gathered all the other informational data; that is the uncertainty which all these other facts unite to illusine.

A similar method is pursued by the careful surgeon who aims to utilize the advantages offered by laboratory, museum and library before undertaking a new and difficult operation. In like manner, the internist avails himself of all avenues of preparation at his disposal, the better to meet the trying situations that may be confronting him.

If the clinical men, and the men out in practice, find this method the one yielding the best results, why would not a similar method yield best results when used with the student? In what other way could the teacher so arouse enthusiasm, or so maintain the student's interest, as by assigning a clinical problem whose solution required a careful linking up of cognate fundamental facts? And in what other way could those fundamental facts be so sharply impressed on the student's mind as when made a living part in the solution of a definite clinical problem?

As we in the United States all painfully know, teachers as well as practitioners (though perhaps with not as keen a realization), the present method of medical teaching consists in pouring into the mind of the student a tremendous conglomerate of uncorrelated, unapplied facts, especially in the socalled fundamental courses. Here in America we all contend that these foundation studies are absolutely essential to an adequate apprehension of the meaning of the clinical phenomena the student will encounter later; in fact, that he cannot possibly understand the meaning and bearing of those clinical phenomena unless he has had first an extensive and thorough grounding in the socalled preclinical subjects. On the other hand, the European is said to think that much of the time spent on thus aggregating facts uncorrelated with definite applications is, in reality, time wasted; that at best the student can retain but a relatively small part of all set forth, by the American plan, during the first two years, especially since its concrete relationship to medicine is not emphasized by clinical contact. He feels that the student, when burdened with such a heterogeneous mass of unsystematized data, is not able to handle his clinical problems wisely. So strong may be his conviction as to cause him to go to the other extreme and introduce his students to clinical problems when there exists practically no foundation work whatever. Such method we do not hesitate to criticize rather severely; but, on the other hand, have we deliberated carefully as to what justification the European may have for his criticism? Certainly, we are not satisfied with our present method of teaching medical students. The clinical men are sure something is radically wrong with the presentation in the preclinical years; the preclinical men are furtively restless, though much inclined to continue reservedly dignified; the students are growing resentful though discreetly inarticulate—except among themselves; abroad among the laity there is a smouldering questioning. In the face of all this it would seem as if

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something might be done to weld together the advantageous points of both American and Continental systems while largely avoiding the demerits of each; it would seem that some plan might be evolved that would train the student in a closely coordinated manner, and that would keep him keyed up all the time with that enthusiastic interest that serves mightily to fix facts deeply in memory. The problem method, which is herewith submitted, might well be such a plan.

OUTLINE OF METHOD

In the problem method of teaching medicine the student is taken first to the clinic where he is shown a fairly typical case. To the student, or class, the instructor carefully points out the several leading manifestations of that particular disease entity, emphasizing over and over again what are the principal points to recognize in the diagnosis, and reiterating that each point demands a logical explanation from the realms of anatomy, physiology, and pathology; but what this explanation is, the clinical instructor refrains from discussing, as its ascertainment constitutes the very essence of the student's problem.

At the close of the clinical period, the instructor tells his class they are to proceed thence to the department of anatomy there to learn whatever in that department pertains to the clinical subject discussed; from there they are to proceed to the department of physiology (if in fact the departments of anatomy and physiology have not by that time become closely coordinated and amalgamated) there to learn what may be the functional significance of the structures involved; from there they go to the department of pathology-bacteriology to study what alterations from normal structure and functioning this particular disease entity may probably produce. All the time they will endeavor to learn the significance of many facts in their relation to a particular fact; will seek to ascertain the fundamental conditions that help to explain the troubles assailing suffering humanity; they will have an exceedingly definite goal toward which the several investigations being undertaken correlatively point. They will gather pertinent data around a central object; they will be afire with enthusiasm to learn whatever may help to enlighten.

Having thus received from the several fundamental departments such information as can be quarried, the class returns to its clinical instructor. The instructor endeavors to have ready at this time both the former patient and also a new one manifesting similar symptoms and stages as were beheld at first. One by one he recalls the several manifestations, and concerning each one he closely questions the class, drawing from the students such explanations of those manifestations as have been learned from the fundamental departments. Next, he outlines a suitable mode of treatment, shows the class the case or cases that have had such treatment, and then turns them over to a representative of the department of pharmacology and therapeutics for an adequate explanation of the rationale underlying the suggested treatment. (This cooperative teaching by groups is another desirable feature of this plan.) Finally, the class is provided with an extensive reference list to the periodical literature covering the several phases of this particular illness, and told to report at an early date at the seminar for a searching quiz and discussion. (Attending this seminar, in suitable sections, are also those members of the faculty who have cooperated thus far in the teaching; as well as others who may be interested.) Then, having completed this problem satisfactorily, the worthy members of the class are immediately assigned another similar problem—the next one in a carefully graded series, a series that ultimately (in four years, surely) will have covered as much ground as is now covered by the routine schedule.

"Impossible" say some, in consternation. Far from impossible; the method is largely and primarily a matter of administration, coupled, of course, with hearty faculty cooperation. Naturally, the administration of this method requires extensive planning and tactful persuading; while the faculty cooperation necessitates a preliminary deep conviction that the fundamental obligation of the instructor is to prepare the students to become increasingly proficient practitioners of medicine.

But before proceeding further with the argument let us now present a concrete illustration of the method, and, inasmuch as the graded course proceeds from the relatively simple to the relatively complex, we may as well use for a type some heart affection, say auricular fibrillation complicated with aortic leakage.

METHOD ILLUSTRATED

The class gathers in the clinic where the instructor proceeds to point out the leading manifestations of the disease complex, dwells on the important subjective symptoms and the associated objective phenomena, and in a general way indicates the many points essential to glean from the domains of anatomy, physiology and pathology before a correct diagnosis can be made or suitable treatment be attempted; with this preliminary introduction he starts the class on its investigation. Having first obtained from examination of a fellow student a more or less cursory notion of the surface findings in the cardiac region, the members of the class proceed to a painstaking dissection of the correlated area on the cadaver, making a thorough study of the heart's position, relations, coverings, orifices, structure, lining, valves, etc. Then the microscopic appearance of each part is carefully scrutinized. Next the function of the heart as a whole, then of each separate chamber, valve, bundle, and covering is investigated in whatever way the resources of the laboratory of physiology permit; at this time, however, special attention is given to the problem of conduction along the A-V bundle, and to the sundry phenomena produced by alterations in the relative efficiency of valve action.

From the laboratory of physiology the class proceeds to that of pathology, there to make an intensive study of those heart specimens that show minute and gross lesions, in both early and advanced stages, of cases similar to that displayed in the clinic. Any check work that bacteriology can offer will also be studied.

Then, having gathered up in this way all the fundamental data explanatory of the various manifestations of the disease, the students, with attuned and appreciative minds, return to the clinical instructor for further conferences. Again he rehearses the various symptoms, and receives from the mem-

bers of the class keen, intelligent explanations of those symptoms. He is now ready to suggest approved courses of treatment, which he does briefly or turns the class over to the pharmacology therapeutics department for investigation and rational explanation of why this or that medication is logically indicated as likely to assist nature in the curative process. Finally, literature references are given; and the class soon meets the faculty group for a seminar discussion of the leading points involved.

A similar routine may be followed in the clinic caring for fractures, which would involve the study of bones, joints, muscles, and ligaments, under normal and under fracture conditions; or in any of the clinics that look after internal diseases; care being taken that the localized disorders are studied before the disorders of widespread manifestations; or in any of the clinics connected with the various specialties. Each and all of them can readily be adjusted to this method of presentation; some will take more time than others, now in this laboratory and now in that one, but all are adaptable.

ADVANTAGES OF METHOD

The problem method of teaching medicine unifies the courses as no other plan yet tried. The teachers are brought more closely together in the work of cooperative instruction, and thus more nearly attain mutual understanding; but better still, perhaps, is the fact that the student remains in contact with the laboratories throughout his entire four years; he learns thereby not to make snap diagnoses but to put the uncertain to the rational test of experiment and consultation. Associated with each condition studied there is given the opportunity to learn what normal structure and function underlie that trouble, and what abnormality of structure or function induces the morbid condition or is induced by it. Abnormalities of structure, and aberrancies of function, are studied as well rounded entities, not as disparate fractions.

OBJECTIONS TO METHOD

But there are some objections to the adoption of this method of teaching and some formidable difficulties standing before it.

The first objection that will come to mind is that of administration. How would it be possible to arrange a graded course so that all fields of medicine would be covered adequately? This is largely a matter of office study and planning. It would require hearty cooperation from all members of the college faculty; and it assumes the facilities of a large clinic, such as the higher grade schools command. With these two factors assured, the administration would not be difficult.

But would it be possible to give laboratory instruction to all four classes throughout the college year? Certainly; the work would be so planned that no two classes would be assigned to the same laboratory at the same time, but would report for work at definite periods in close orderly sequence. The work would all be planned and scheduled beforehand, only such departures from the schedule being allowed as were necessitated by the exigencies of the clinic; in large cities, however, there are unhappily enough clinically typical cases appearing so that a dearth of illustrative material would be exceptional. The occasional could be studied when and as it appeared.

For purpose of discussion, say that a student's aggregate time spent in the laboratory of anatomy amounted to six hours a week throughout his course; his total time would be about the same as under the present system. This would allow him six hours a week for his other laboratories, six hours a week for his clinics, six hours a week for his special assigned readings and seminars, and six hours a week extra for makeup work, special investigations, additional clinics and conferences. (Many clinics, especially in the later years, would require additional work in pathology-bacteriology, but not in anatomy.) By rotating the classes in regular sequence the laboratories would be fully busy at least four days a week throughout the college year; this would probably necessitate an augmented laboratory force. There would be a marked diminution in didactic lectures in all departments; but an increase in conferences and seminars; and a quickening of interdepartmental cooperation, courtesy, and responsibility.

COOPERATION NECESSARY

But would a faculty agree to work together thus in groups? Especially, would the preclinical men be willing to thus subordinate their departments to a subserving of the clinical instruction? It is well known how jealous teachers can be of their real or assumed prerogatives, how conservative many preclinical men are in their pedagogy, and how many rigid formalists there are in the teaching profession. Yet when we call to mind that ninety-eight per cent. or more of our medical students are training to become practitioners of medicine, and that our bounden duty to them, as well as to society, is to make them as proficient as possible in their chosen vocation, it behooves us to adapt both ourselves and our methods so as to ensure to the fullest extent possible the maximal attainment of the ends sought. Those who are unable to adjust their minds in conformity to the welfare of both the student and society are out of joint with the times and with their environment. If they are unable to attain to an adjustment, they should be gently persuaded to adopt some pursuit more in harmony with their particularistic temperament.

There remains the problem of the two year school, and of the four year school situated in a city too small to afford a varied clinic; how could they adjust themselves to this plan? They couldn't very well; but doesn't the burden of responsibility rest with the school rather than on the plan? Has either the two year school, or the school with inadequate facilities, either an economic or pedagogic justification for continued existence?

CONCLUSION

The problem method of teaching medicine is an attempt to provide the student with a logical correlation of his work; to keep constantly before him throughout his entire course the ideal of service to the welfare of his patient; to inspire him with concentration of thought and effort; to unify the teaching, and to harmonize the teachers. It will stimulate development of the true research spirit, and will tend to make our physicians more thoughtful and scientific.

Does Tissue Fibrinogen Shorten the Clotting Time of Blood When Taken Internally?*

W. M. BILLING and A. P. MATHEWS
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The discovery of a means of shortening the clotting time of blood by the oral ingestion of some substance might place in the hands of physicians a valuable means of controlling hemorrhage. The discovery, therefore, announced by C. A. Mills and his coworkers (3), that tissue fibrinogen of Wooldridge had this power, has attracted great interest, and also much scepticism, since the rapid absorption from the intestine of such a coarse colloid, especially one destroyed by the intestinal enzymes, seems unlikely. It seemed desirable to test out this action in more individuals and to try certain controls which were omitted by Mills owing to their not seeming necessary. The present paper contains results completely confirming the findings of Mills and his colleagues.

It will be recalled that tissue fibrinogen is the protein constituent of tissues which has the power of clotting blood, and also fibrinogen solutions when these contain calcium. It was isolated and named by Wooldridge in 1885. It is one of the two thromboplastic substances found in juice from injured tissues, the other substance being the phospholipin, cephalin, isolated by Bordet and Howell and identified by the latter.

These two thromboplastic agents have been shown by Mills (1) and by Mills and Mathews (7) to have quite different actions. Mills and his coworkers (1) found that tissue fibrinogen clotted blood by making a direct union with blood fibrinogen probably through calcium, the fibrin formed by it being tissue fibrinogen—calcium—blood fibrinogen. Tissue fibrinogen is part of the structural proteins of the cells, and it is this union which anchors the clotted blood to the injured tissue. Mills and Mathews showed that this clotting does not depend on thrombin or prothrombin, since tissue fibrinogen will clot blood in the entire absence of both thrombin and prothrombin; and no thrombin is produced in this clotting.

The other thromboplastic substance in tissue juice, namely cephalin, it will be recalled, converts prothrombin (or serozyme) to thrombin, probably by uniting with the prothrombin through calcium (Bordet's explanation). The thrombin thus formed clots blood presumably by direct union with fibrinogen, thus making thrombin fibrin.

There are then two distinct mechanisms of blood clotting of which the older is the tissue fibrinogen clotting.

It is known that tissue fibrinogen will clot blood intravascularly with great speed if a little of it is abruptly injected; but Mills and his coworkers found that any amount of it could be injected subcutaneously or intraperitoneally in animals without danger and with the effect of shortening the clotting time about one half. Thrombin, however, rapidly loses its power of causing intravascular clotting and it in no way effects the clotting time when injected subcutaneously, while it is stated that intravenous injection of cephalin will shorten clotting time. Yet subcutaneous or intraperitoneal injections of cephalin have no action.

But the most surprising discovery was made by Mills, Nakayama, Dorst and Mynchenberg (3) that tissue fibrinogen, although it is so coarse a colloid that it will not filter through a fine filter paper, yet when five c.c. of a one and one half per cent. solution are taken by mouth on an empty stomach in iced water, so that it quickly enters the empty duodenum, it is absorbed so quickly that in from fifteen to thirty minutes the clotting time of the blood may be reduced even fifty per cent. and more. Inasmuch as the in vitro action of tissue fibrinogen is rapidly destroyed by both pepsin and trypsin (4) this rapid intestinal absorption is so surprising as to have aroused many expressions of incredulity. The criticism has been made of Mills's results that they were due to the salt solution injected or to the iced water.

TABLE I

THE EFFECT OF INJECTIONS OF NORMAL SALT SOLUTION

Case	Wt.	Normal clotting time in minutes before salt injection	Elapsed time after injection before second clotting time	Clotting time in minutes after injections of salt solution.	Change in clotting time.
			Hrs. Min.		
A. S. B.	179	2.67	1 33	2.75	+ 3.0%
G. E.	132	2.58	1 15	2.48	— 3.9%
L. F.	190	2.86	1 17	2.72	— 4.9%
E. J.	135	2.60	1 23	2.25	—13.0%
C. A. M.	185	2.70	1 30	3.12	+16.0%
R. P.	115	2.87	1 10	2.74	— 4.5%
F. P.	160	3.17	1 20	3.00	— 5.4%
W. S.	135	2.76	1 08	2.82	+ 2.2%
G. V.	122	3.17	1 12	2.98	— 6.0%
L. W.	172	2.25	1 50	2.17	— 3.5%
Average effect (reduction)					3.9%

In view of the great clinical value and theoretical interest of these observations it seemed wise to confirm them, and at the same time to try certain controls such as the action on clotting of salt solution when injected subcutaneously and also of ice water taken by mouth, although it seemed highly improbable that these procedures would have any effect on the clotting time of the blood.

In all the following experiments on a dozen or twenty normal adults, the clotting time was determined by Mills's simple but reliable clinical method, a method which gives very uniform results.

Subcutaneous injection.—We first tried the effect of the subcutaneous injection of one and five tenths c.c. of a physiological salt solution nine tenths per cent. in the deltoid muscle of the arm of ten healthy adults. Table I shows that this procedure produced no noticeable change in the clotting time of the blood drawn about one and one half hours after the injection. The changes recorded are within the limits of the usual experimental error of the method except possibly two, in which changes of sixteen to

*From the Department of Biochemistry of the University of Cincinnati.

TABLE II

THE EFFECT OF INJECTIONS OF TISSUE FIBRINOGEN

Cases	Wt.	Normal clotting time in minutes	Time of tissue fibrinogen injection P. M. Hrs.	Min.	Elapsed time after injection to second clotting time Hrs.	Min.	Clotting time in minutes after injection.	Change in clotting time. Per cent reduction.	Condition of arm twenty hours later
A. S. B.	179	2.82	3	20	1	15	2.33	18	tender to touch
E.	132	2.60	3	35	1	31	2.17	20	tender to touch
F.	190	2.77	2	30	1	12	1.77	36	no reaction
J.	135	3.00	3	38	1	19	2.76	8	slight swelling
					1	56	2.30	24	no induration
R. T. K.	135	2.25	3	40	1	19	2.67	+18	tender to touch
					1	50	1.92	15	
C. A. M.	185	2.82	4	45	1	05	2.00	29	no reaction
R. P.	115	2.75	3	11	1	21	1.60	42	salt induration
									fibrinogen none
F. P.	160	3.25	3	20	1	40	2.17	33	induration
W. S.	135	2.56	3	13	1	32	2.82	+10	no reaction
					2	02	1.95	24	
G. V.	122	2.68	3	25	1	22	2.18	20	no reaction
L. W.	172	2.33	3	28	1	37	2.10	10	tender to touch

Average effect (reduction).....25%

hirteen per cent. were recorded but in opposite directions. Injection was made between 10:25 and 10:52 a. m. about three hours after breakfast. The slight reduction of three and nine tenths per cent. n the average is without significance.

We then tested similarly the action of tissue fibrinogen, on the same persons.

That tissue fibrinogen has a strong coagulating action under similar conditions is shown in Table II. The subcutaneous injection of twenty-two and one half mgs. of tissue fibrinogen[1] in one and one half c.c. of physiological salt solution produced in one to two hours quite uniformly a marked reduction in clotting time, the average being twenty-five per cent. reduction. In two cases eight and ten per cent. increases in clotting time were observed, one hour and nineteen minutes and one hour and thirty-two minutes respectively after the injection, but a test one half hour later showed that in these individuals the absorption had probably been slow as the clotting time was found to be reduced on this later test. The amount injected, one and one half c.c., is the minimum dose recommended by Mills, who advocates one c.c. for seventy-five pounds weight. The injections were given to the same subjects as the salt injections n Table I, and on the same day, three hours after unch. The results leave no doubt of the efficacy of small doses of tissue fibrinogen in lowering clotting time after subcutaneous injection.

Oral ingestion.—We then tried the effect of oral administration, first trying a control experiment on he effect of drinking ice water on the clotting time.

Table III. shows that drinking ice water (eight ounces) at 11:30 a. m. when the stomach was presumably empty did not affect clotting time in six healthy adults.

We now proceeded to test the action of oral ingestion of tissue fibrinogen in the same individuals.

In these experiments the minimum dose of a suspension of tissue fibrinogen was used. Three c.c. of suspension containing fifteen mgs. tissue fibrinogen per c.c. were administered in eight ounces of iced water. The experiments were performed at about 1:30 a. m. and in all cases at least three hours after the ingestion of food. The clotting times were determined immediately before and fifteen minutes after the administration of tissue fibrinogen. It will be seen by an inspection of Table IV that small doses of tissue fibrinogen, administered by mouth, together with a little iced water given to delay tryptic

TABLE III

EFFECT OF INGESTION OF ICED WATER ON CLOTTING TIME

Cases	Normal clotting time in minutes	Clotting time in minutes after receiving iced water	Change in clotting time
A. M. D.*	2.30	2.40	+ 4.3%
R. W. P.	2.30	2.50	+ 8.7%
C. A. M.	2.30	2.30	none
R. T. K.	2.10	2.30	+ 9.1%
A. S. B.	2.20	2.20	none
C. P.	2.40	2.80	+16.5%

Average effect (increase) 6.4%

*Female

digestion, result in a marked lowering of the clotting time of blood, the average reduction observed here being forty-eight per cent.

In the case of C. P. it may be noted that before ingestion of the tissue fibrinogen the clotting time is somewhat longer than usual. This person was at the time suffering from epistaxis, which had lasted ten days or more. The hemorrhage ceased one hour after the administration of tissue fibrinogen. It recurred in eight hours, lasting until the next morning, when seventy-five mgs. (five c.c. suspension) were administered by mouth, the hemorrhage ceased and no further trouble was experienced.

TABLE IV

THE EFFECT OF ORAL ADMINISTRATION OF TISSUE FIBRINOGEN

Cases	Normal clotting time in minutes	Clotting time in minutes after receiving Fibrinogen	Change in clotting time. Per cent reduction
J. L. B.	2.40	1.50	37
E. B.*	2.30	1.70	26
W. M. B.	2.13	1.00	48
A. S. B.	2.30	1.20	48
T. D.	2.10	0.80	62
A. M. D.*	2.40	1.80	25
B. G.*	2.90	1.70	41
E. A. J.	2.30	1.40	39
R. T. K.	3.40	1.90	46
A. P. M.	3.15	1.55	51
C. A. M.	2.50	1.30	48
C. G. M.	3.00	1.20	60
W. B. M*	3.10	1.40	55
F. P.	2.30	0.70	70
C. P.	4.10	1.70	59
R. W. P.	2.60	1.80	31
R. M. S.*	2.70	1.50	48
G. V.	2.20	0.50	77
L. W.	2.45	1.50	40

Average effect (reduction).....47.9%

*Female

The fact observed by Mills that the clotting time of the blood can be so quickly affected by tissue fibrinogen taken by mouth, an observation which we have found confirmed in every experiment we have tried, provided only that the substance gets promptly

[1]The tissue fibrinogen used in these experiments was prepared by extracting fresh, hashed calf's lungs with nine per cent sodium chloride filtering; precipitating the extract by half saturation with $(NH_4)_2SO_4$, washing and dialyzing the precipitate and sterilizing it by Mills's method (6).

into the empty intestine, leaves unanswered as yet the mechanism of this action. Further work will be undertaken to discover how it is possible for a substance in so coarse a state of dispersion to be absorbed so rapidly that the minute amount of it which is absorbed can alter the clotting time of the whole blood. It is possible that the active principle producing this result is not the protein at all, but some smaller decomposition product. But there is as yet no evidence of this; nor are we able to suggest any explanation for the shortening of the clotting time. It will be necessary to examine carefully what factors of the clotting are changed in the blood so altered; whether it is the proserozyme (prothrombin) content, the cephalin content, the reduction of an antithrombin, or some other change. The investigation will be continued in an endeavor to solve these important problems.

SUMMARY

1. The subcutaneous injection of normal saline solution produced no effect within the time limit of the experiment on the clotting time of normal human blood.

2. The subcutaneous injection of a small dose (twenty-two mgs.) of tissue fibrinogen gave an average lowering of twenty-five per cent. in the clotting time of the blood of eleven normal persons, one to two hours after the injection.

3. Iced water, taken by mouth, produced no effect on the clotting time of normal human blood.

4. Forty-five mgs. of tissue fibrinogen, when administered by mouth in ounces of iced water, to each of nineteen healthy adult persons when the stomach and duodenum were empty produced an average lowering in the clotting time of blood of forty-eight per cent.

5. These results confirm the observations of Mills that tissue fibrinogen, when injected subcutaneously, shortens the clotting time of blood, and that the same action is produced more rapidly by intestinal absorption, when administered in ice water when the stomach and intestine are at rest and not digesting.

6. The explanation of this action cannot be given without further experimental investigation, which is at present under way.

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The Back or Dorsal Structures From the Internist's Point of View

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Let me restate former postulates preliminary to offering some mature observations:

A clinical scrutiny of the back areas, the dorsal structures or the rear parts of the chest and trunk, will often reveal facts of as much, indeed of far more, significance to the internist than to the orthopedist. A host of disorders, or miseries, or disablements, can be there observed—similar in origins and natural history—but capable of more than one line of interpretation and resources for relief.

For the internist to omit such exploration leaves his clinical obligations only half discharged. Unless the back and associated structures come in for appraisal and the application of locally directed remediation to the causal factors at work, the direct or contributory effects often elude the consideration due them. Also: when such graphic symptoms as are shown by the back structures subside, or yield to locally applied remediation, there can thereby be secured a gratifying reduction in peripheral irritations situated in the same line of innervation. Most of these effects are readaptations in the disordered reflex circuits connected with certain outlying, but definitely correlated, sources of irritation. The effects of these are usually displayed as local spastic states, tonic protective spasm. Often these peripheral lesions seem in no way a part of the dorsal disturbance, yet it can readily be shown that they are.

Also such graphic symptoms displayed in the dorsal structures as do arise tend to subside or yield to locally applied remediation. Then can be secured, also, a marked reduction in the peripheral irritations causing them. This comes about chiefly through readaptation or reconditioning of the disordered reflex circuits connected with the outlying, but definitely correlated, sources of irritation.

The modus operandi is, in short, a harmonizing or rebalancing of the reflex circuits involved. In the process of investigation other structures and correlated functional interplays tend to fall into their place. They may not be exactly explainable but demonstrate the infinite complexities with which man, as a vitalized and chemical engine, is endowed. The objective is to restore automatic mobile equilibrum.

Nature, always of boundless resourcefulness, often needs only relief from hindrances, and to secure favorable positions and encouragements to proceed with her work.

Furthermore, the best influences and instrumentalities are always the simpler, more direct stimuli, and also to begin as near as possible to centres and to apply the right kind of peripheral rousing.

It therefore would seem evident that deep significances reside in impairments of pliancy, mobility, symmetrical balance and of tone in back muscles and static structures, most of which are phenomena of tonic protective spasm due to foci of infections or other irritation. Whatsoever may have been the primary cause of disease, or of mere disorder or disablement, whether we blame germs or pathological chemistry as origins, it is plain that a host of distressful reflex effects do follow, especially those which fail to yield when the primary ailments or disturbances are overcome. These secondary causes, shown in their obstructive, or distressing, or disabling effects, demand relief for themselves. It is a fact that where the primary traumatic, infective or biochemical causes persist, they can be made to yield satisfactorily on the remedying of those associated, or consecutive, or intimately correlated causes. Many disordered states, moreover, must follow upon anatomical or developmental anomalies, occurring in the phenomena of evolution.

So soon as proportionate attention is given to structures of the back, then will cease many omissions, not to say blunders, discredits, or even disasters. The clinical tendency[1] is to ignore this diagnostic field, which is regarded as a sort of fad in those who emphasize it. There is here a domain of effort which must be included in any scheme of exploration for which completeness is asserted.

Expert examination of the back will reveal a variety of facts equally significant with those obtained by experts in exploring such localities as the chest, abdomen, pelvis, the heart and bloodvessels, and the like. Clinical[2] attention has thus far neglected this region; as yet there is little coordinated information on record about the subject.

Backache or tenderness on deep palpation is a quadruple phenomenon compounded of:

1. A tonic spasm exhibited in the paravertebral muscles and their fibrous attachments (clinically a fibromyositis); 2, an irritated, or exhausted, subcentre at the cord level (metamere) corresponding to the innervation of the reflexopathy; 3, a peripheral lesion, or source of irritation, and hence of reflex disturbance; 4, a disturbance of metabolic balance.

Beyond these major and constantly recurring causal fastors lie diverse and sundry associated ones varying in kind and degree as the stage is acute, subacute or chronic, in accord with age, strength, habits, in particular as to the nature of the primary disorder or disease; especially as to the state of energy content.

Pains or tendernesses in the back—as revealed by tactile exploration—are not only among the more prevalent of symptoms, but their significances are too commonly misinterpreted. On examination of the backs of a considerable proportion of those making no complaints of sensory disturbances in that region, there will often be found unsuspected or latent tenderness, soreness and pain.

A study of backs thus furnishes indications of practical significance. Attention need not be confined to those only in which some obtrusive pain, tenderness, disability, deformity or other indicia appear.

Backache, *per se,* deserves relief. It varies all the way from acutest agony through various degrees of misery and impaired usefulness to an embittered existence.

Pain is rarely, if ever, felt in more than one locality at a time. That pain which is most severe dominates lesser pains. When this is relieved other pains are then consciously perceived. The secondary pains sink below the threshold of consciousness while the most severe one occupies the foreground of attention. The series of pains thus may include three or four or more.

Correlated with frank pains are also various kinds and degrees of aches, miseries or depressions, with a more or less sensory basis. The elements of these distresses are often complex blends of weariness, fatigue, exhaustion, or long continued sensory impacts on the consciousness incessantly repeated and unduly protracted. Likewise there is the emotional element of exaggerated attention to the distress; misinterpretation of factors involved causing anxieties lest this or that part, or organ, may be seriously affected.

Backaches are especially common—as has been said—in late age. The causes so uniformly elude location and satisfactory explanation that one of two courses of action is usually adopted; either to accept philosophically the burden of miseries, limitations of activity, or to deny all pain. It is true a pain may be resolutely subordinated, but since its economic purpose is to warn of disease or injury it deserves expert attention and radical remediation, otherwise catastrophe may follow. Such a fool's paradise is worse than an extrahazardous occupation.

WHAT CAN THE INTERNIST LEARN FROM APPRAISEMENT OF THE POSTERIOR SURFACES OF THE TORSO?

Briefly, examination of the back by inspection and especially by palpation, tactile apperception, also by a survey of conformation, proportionateness, relative resistances, sensitiveness, anomalies of adaptation, etc., aids one in the appraisement of many associated phenomena and reflexopathic effects. These reflexopathies bear significantly on the whole domain of sympathetic disturbances in the organism as a whole.

While such evidences as these may seem of more importance to me and others similarly interested, than to the majority of clinicians, certain it is that observation of the back areas is helpful in throwing light upon a wide variety of anomalous, distressful or diseased states due to disturbances of the spinal nerve centres and occurring at corresponding cord levels or metameres.

Evidence on this subject is growing and has already reached respectable proportions through the efforts and interpretations of many. In a former paper presented a suggestive sketch of the subject. A few points will be cited here:

Many, indeed most, maladies, not only the acute but more the subacute and chronic, are reflected in,

[1] During my fifteen years' experience as professor of diseases of children at the Polyclinic Hospital School for Graduates in Medicine, it was my habit to examine the backs of all patients. The older students constantly complained that this was a waste of time and effort.

[2] F. M. Pottenger has recently devised an ingenious and efficient means of appraising tuberculous lesions through spastic phenomena in the back and thorax and shoulder girdle muscles. What is here offered is from personal experiences and inferences. I am confident in one particular: that when the structures of the back come to get the same thorough and critical attention as is given to the organs of respiration, circulation, digestion, and reproduction, we shall come to understand bodily ailments from both direct and indirect (reflexogenic) directions.

and can be interpreted from, the back. It is also a fact—readily corroborated—that a large proportion of distresses, disorders, can be relieved or reduced by induced movements, pressure, heat and other biokinetic procedures directed to the back.

No symptoms may be noticeable except on deep and persistent palpation, or on wide hand pressures, followed by voluntary movements, bendings, rotations and stretchings of the limbs, forceful extension of extremities, preferably while lying prone on the abdomen. Any overtension in the muscles must be relaxed as has been elsewhere described by impacts followed by voluntary movements of the affected muscles.

Of course full x ray studies should be pursued unless the problems are obviously simple ones and symptoms do disappear under the treatment to be suggested.

Among the points to be observed are these:

Pains, tendernesses on touch, sorenesses on voluntary movement, alterations of conformation—only to be learned by many comparative observations on the normal back asymmetries—also twists, lamenesses, limitations of excursus, restrictions, adhesions, but especially whatever can be incriminated as due to spasticities in muscle fibres, chiefly in the erector spinæ muscles, and those of closely associated innervation.

These disorders of shape and density (morphopathies) are caused by reflex overstimulations and due to irritations arising either in the muscles (clinically a fibromyositis) or also—perhaps always—due to irritation as in a viscus reflected to the paravertebral, and hence outwardly to other muscles. Certain it is these often disappear by merely releasing the tonic spasm *in situ*. When they do disappear the irritation in the spinal centres tends to subside, also that in the viscus controlled from the same segmental distribution. Flatulence is a deeply significant phenomenon and is closely correlated to marked fluctuations in blood pressure. As intestinal gas is relieved so do variegated distresses disappear and recoveries progress.

These spastic states in vessels or viscera readily yield to gentle manipulations on such areas of the back as are associated (segmentally) with the area of disturbance.

Relief to the tonic spasm works both ways, forward and backward, and eventuates in relief of many correlated visceral distresses or disorders. The mechanism of reaction is probably due to releasing pentup or retarded energies through biokinetic influencing by, 1, impacts or tapping upon the nerve in continuity; 2, excitation of accessible centres by induced movements (reflexogenesis), and 3, by balancing effects exerted on vasomotor and visceromotor function, hence by improvement in nutrition of the cell bodies in the interdiscal spaces. S. Weir Mitchell called my attention to these points forty years ago and constantly saw patients[3] treated by him in his earlier years in whom the results were amply confirmed.

Among the disabling effects thus removed through orthokinesis are: restoration of not only visceral nutrition, metabolic improvements, and repair, but also in organs of special sense, eyes, ears, of respiration etc., likewise in the whole domain of visceral disturbances.

The special subject here offered is the possibilities of manipulative or manual orthopedics (or better orthokinetics) of the spinal column. What is the common denominator, the mutual integer, or expotential?

It would seem it will be found in a state of relative (spastic) rigidity, loss of normal mobility, of impaired pliancy of the paravertebral structures (those lying two or three inches alongside the backbone) whereby some kinds and degrees of regulative influences are exerted upon the outgoing nerves.

A well established clinical relationship exists between these subsidiary centres in the cord and diseased conditions. These morbidities are shown by alterations in the paravertebral structures both morphogenic or structural, also by pathognomonic sensory disorders as will be later pointed out in diagnostic contrasts. The fact is demonstrable that when these recognizable and uniform phenomena are made to disappear, there follow—coincidentally—a lessening, or modification, or disappearance, of the morbid or distress phenomena.

What causes these manifestations of disorder to disappear so uniformly? It would seem the common denominator or genetic agency is the application of judicious minor shocks or rousing impacts upon the vertebral bodies or those structures intimately associated with them. These seem to afford liberating stimuli to retarded energies. "Biotic energy in order to be effective must be abrupt."—Sherrington.

Good and fairly uniform results follow almost any form of rightly directed gentle, firmly applied force, or emphatic mechanical arousing through spinal impacts or pressures, so long as they are capable of stirring up the reflex mechanisms in definite particulars. Results follow in accord with design, and with known innervations. During states of health these interactions, these comings to rest after stimulation (equilibration), are so automatic that they escape notice. During ill health (maladjustment of function) they are readily noticeable, determinable and controllable. They follow in due order, and in accord with biological laws. They can do no harm unless outrageously violent.

To what can we ascribe the nature of the effects by impacts upon, or agitation or commotion of, the spinal masses?

Several varieties of the same grouping of effects are manifested, all the way from the bone and adjacent structures along the nerves to the part out of gear and—collaterally—by the complex innervation of the vegetative or autonomic nerve distributions.

Some part of these effects are produced by influencing the spinal reflexes of contraction in the hollow and the tubular viscera. These are capable of demonstration upon the heart, the aorta, the lungs, the stomach, the kidneys, and other structures shown by retraction of outline (seen through the fluoroscope).

Some part of the effects are produced by arousing reflex responses in those governing the contraction of bloodvessels (vasoconstriction) whereby the ebb and flow of fluids is activated or enhanced through contraction induced in the arteries; also in the in-

[3]One of these was a man from Arkansas whom I saw in his old age, named William Penn, who had paraplegia. This Dr. Mitchell explained was his first case to yield astonishingly to manipulation of the back, followed by voluntary graded movements.

creased dilatation which follows after release. Not so much can be done to influence arterial relaxation, but after contraction is induced relaxation follows, hence alternations of opening and closing, enhanced current flow, blood and lymph propulsion, hence nutritive distribution.

GROSS PHENOMENA OF DISORDERED STATES REFLECTED UPON THE PARAVERTEBRAL STRUCTURES

The intervertebral spaces and the paravertebral structures are together capable of cooperating and to influence a general or mass movement of the vertebræ of considerable extent. It is fair to assume that the integrity of the delicate structures, constituting the subsidiary spinal nerve centres in the cord, depends in large measure on not only the normal pliancy or movability of these masses but it is beneficial that they should be regularly induced to move, or made to voluntarily move—that is to perform, through passive or active exercise. If they are extensively disturbed, that is, if disease has produced deleterious effects on the nerve cells between the individual bones of the back (intervertebral discs and contained cell bodies) a certain degree of sensory discomfort follows upon their being unduly moved or impinged upon.

Hence arise those significant sensory phenomena to be later described, so useful in diagnosis and the location of the irritation.

When the diseased state has been long protracted, these paravertebral structures suffer morphopathic (mass) changes, hence arise the familiar local bogginess, and later the rigidities, the overtense (spastic) muscles and stiff periarthritic fibres to be described.

The remedial measures consist of gentle, particularized pressures and relaxations, alternating; or by firm distributed pressure—this way and that. Steady pressures on paravertebral muscles induce the reaction of dilatation in the blood channels; whereas alternated impacts or pressures induce contraction. Uniformly a sensory reaction is also induced at the corresponding neuromere.

Another measure, elsewhere described and extolled, is lifting and pulling the skin and underlying structures, a "subdermal traction." As has been shown this measure is peculiarly valuable not only to expedite circulation and to generate or induce local heat, to soothe, to relieve, but also there will be found over an affected spinal area almost always adhesions, and when these adhesions are pulled upon pain is felt there (sensory reflex) and at no other place. Also when they "fetch away" there is a noticeable sound or "snap," a painful tearing of binding fibres. This also is a sensory phenomenon characteristic of a local or restricted spinal as well as a paravertebral irritation. Also skin (subdermal) tractions described afford exceptionally effective spinal stimulation.

TYPES OF MECHANICAL STIMULATION SUITABLE FOR REMEDIES

In all acute, less marked in subacute, and to a lesser degree in the majority of protracted or chronic disorders, there will be found characteristic phenomena upon palpation on the paravertebral structures adjacent to those intervertebral spaces in which lie the cell bodies from which arise the spinal nerves innervating the part affected. Any one can test this for himself. The one proviso which must be insisted on is some accuracy and precision in eliciting awareness.

EXPLORATION OF THE BACK

The patient should lie prone and fully relaxed so that the examiner may have free access to the whole naked posterior surfaces for palpation. This should be done with much deliberation, many pauses, conversing the while with a view of distracting attention from the procedures, casually resting the hand palm downward here and there, noting the character of the structures, and variants in shape, conformation, deformation or tension in larger or smaller masses of structure; also any evidences of resistance in masses which normally should be yielding. These rigidities are due to either psychic hypertension, to apprehension, to strained attention, or to spasm, a tonic protective spasticity whereby one group of muscles takes on extra burdens or "loads" to relieve another which deserves, or needs, relief from excess tension (overload); which in turn is due to some former, perhaps long continued spasm. Thus arise deformations, primarily spastic as a scoliosis, or forward bending, interrupting or irregularities in tension of the large posterior muscle masses, or of the anterior group, psoas, quadratus lumborum, or again there may be hypertension in the gluteal groups, shoulder girdle or external abdominal or diaphragm, and the like.

Or the spasm may have merged into disabilities involving such causes as produce fibromyositis, lumbago, pleurodynia, sacroiliac subluxation (a common cause), coccygodynia, or an original neuritis, as of the sciatic, pubic, crural, and the like. Thus the centres—especially subcentres—suffer overstress and lowered nutrition.

As to sources of possible irritation inducing these spasms they are legion, including the one group which—if the patient be a female—is usually incriminated, viz.: the genito or uteroovarian. If a male, the corresponding group may be suspected, the bladder, the prostate, the urethra or the testicle. In both sexes the gastrointestinal field is rich in contributions to cramp, or protective spasm.

Indeed in that group of distresses which accompany, or distinguish, gastrointestinal catarrh, i. e., constipation, flatulence, colic; also in cardiovascular irregularities, vasomotor imbalances, sweating, dyspnea, spastic constipation, sleeplessness and the like, much radical relief can be afforded by releasing the spasm in the back, which in turn releases the flatulence, the spasm of the pylorus, of the colon, the gallbladder, duodenum, the diaphragm, etc. Thus the source of many "visceral pantomimes" are eliminated.

The method of palpation is important. As has been said, it should begin by appraising the energy status, or general tonus and conformation as recommended, and should proceed by particularized tactile explorations, by pressing gently here and there, and insinuating the finger tips in and about the structures with a view of eliciting anomalous resistances and also latent tendernesses; gently pushing the structures down, across and sidewise, or grasping the dermal structures and gently lifting them, then going farther and seizing the underlying (subdermal)

structures, the surface muscles and fibrous attachments; in short "feeling," or groping among, the surface and subsurfaces of an area. We have here a domain of tactile diagnosis little employed, yet just as scientific as that now highly specialized and established art of palpation, percussion and auscultation employed in diagnosis of thoracic and cardiovascular organs. Indeed, F. M. Pottenger (*op. cit.*) has described a series of reflex diagnostic phenomena appearing in correlated muscle groups serving as a guide to tuberculous and other sources of reflex disorders.

I have been impressed (as have others) with the rarity of tactual capabilities among physicians. While they can be cultivated those who are fundamentally deficient in the touch sense outnumber the others and often "to save their face" belittle its importance or frankly deny the findings.

FACTS PERCEIVABLE THROUGH INTELLIGENT OR EDUCATED FINGER TOUCHES

1. A state of tension, or subtension, amounting to rigidity in the structures parallel to the vertebral axis (chiefly) and also often in the transverse muscle fibres; also a local density, cramp, or tonic spasm or spastic state giving a tactile sensation (to the fingers) of a tightly drawn fiddle string, a clearly defined fibrous resistance.

2. A state of tenderness on pressure is also felt by the patient; often a dull, sometimes a sharp, pain described usually as like a hot object pressed in, or a penetration as by a pointed object, e. g., a finger nail. This is seldom suspected yet none the less pronounced and elicited entirely free from suggestion, it is directly over, or in, the cramped area.

3. By gently alternating the pressures applied above or near this area of rigidity, of tension and subjective tenderness, these phenomena will usually lessen notably even during the procedure or soon thereafter. When applied on alternate days this tenderness gradually disappears and with its passing improvement ensues in the state of irritation in the corresponding area of innervation, also in the structures causing this irritation. The centres are thus tranquillized and apparently become better supplied with blood.

4. During the application of the pressures—after an interval of a few, two or three, minutes and again exerting them the phenomena of tension will lessen yet more. The recommendation is to repeat this procedure three, or better four, times with intervals. The last time of manipulation the phenomena are perceived, both by the physician and the patient, to have usually lessened at least fifty per cent.; often more.

5. Distinct relief will also be found by the patient from distressful phenomena in those peripheral parts affected, e. g., irritation in the respiratory or digestive tract, cough, soreness in throat, etc., or discomforts, notably distresses, tenderness, and the like in the intestines, also those in muscles, joints, or whatsoever area or structure is disordered or diseased.

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A Comparison of the Renal Function Before and After Prostatectomy

*With an Investigation of the Concomitant Infection of the Gland and the Genitourinary Tract in Twenty Cases of Suprapubic Prostatectomy for Senile Hypertrophy of the Gland**

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My selection of this topic is based on a desire to show that the man who is compelled to lead a catheter life is not an absolute derelict from a surgical point of view but is surely destined to a hopeless and miserable end from a medical point of view. A man who has used a catheter for years may come to realize that this instrument is, after all, a curse, even though it may have given considerable relief.

My remarks will be confined to the class of enlarged prostates that are manifested by a train of well known symptoms in the declining years of life and which frequently cause obstruction to the urinary flow. For this reason I prefer to deal with the term senile hypertrophy instead of the general term hypertrophy of the prostate.

Many will bear me out that the victim of senile hypertrophy if not relieved dies of uremia as the final and contributory cause of that malady. It is common knowledge that nothing is so damaging to the secreting power of the kidneys as interference with the channels leading to and from the bladder. The senile prostatic patient can never voluntarily completely empty his bladder. He attempts to void every ten minutes hoping thereby to rid himself of frequency but to no avail. He can only expel, after considerable straining, the amount above the residual, which quantity is ever present in the postprostatic pouch and which causes continual reflexes without giving gratification when voided. The residual urine gradually increases as compensatory hypertrophy progresses and the muscular power of the bladder diminishes, owing to persistent overstrain from the attempt to conquer the obstruction to the urinary flow. Dilatation ensues and eventually the bladder may contain several pints of urine. The walls may become extremely thin or muscular trabeculæ may develop, between which the mucous membrane bulges out in the form of saccules. The results are similar to those due to any other obstruction to the outflow of urine. The ureters become more or less dilated. Whether this dilatation is caused by the increased thickness of the bladder wall, by the pressure of the distended bladder on the oblique insertion of the intramural portions

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of the ureter, or by simple difficulty of micturition, is unsettled. Whatever the cause, the renal pelvis soon becomes slightly, moderately, or markedly dilated. The kidneys themselves are unable, without deterioration, to withstand the increased pressure, and at an early stage show signs of interstitial nephritis. Moreover, one should bear in mind that at the time of life at which enlargement of the prostate occurs, it often happens that the kidneys are the seat of some other chronic pathological condition besides prostatic trouble.

An ascending infection thus still further damages the secretory power of the kidneys until well nigh beyond hope of repair. It is surprising how much insult such a kidney can withstand for months or years before the entire renal cortex is transferred into a huge sac having no function whatever, beyond the destructive influence upon the body. Such a kidney has lost not only all function of secretion but acts as an ideal incubator for the development of bacterial toxins (Fig. 1). Often phosphatic calculi in pelvis, ureter or bladder are complicating byproducts resulting from decomposed and stagnant urine in the tracts or localities where a superimposed infection destroys the slightest chance of alleviating the sufferer from the complications, much less from the original disease.

Surgical intervention with a view to relieving the kidney and improving its function is the only rational procedure in these cases. Proper preparation of the patient generally and of the bladder particularly are essential to success. However, in many cases where at first glance immediate surgery seems indicated this can be postponed indefinitely, provided the patient is promptly relieved by suitable substitutes. Urine retention from almost any cause can be relieved temporarily by other means than surgery. Profuse hemorrhage from the prostate or bladder neck are the only indications for immediate surgical interference. Mortality in prostatectomy has become largely a thing of the past since the operation has been performed in two stages. This is the result not so much of the disinfection of the bladder as of the detoxication of the patient by the improvement of his changed renal function.

Urine.—The initial complaint of frequency, tenesmus, pain and lack of gratification is in reality but nature's attempt to rid the untiring bladder of its residual urine. This attempt manifests itself, in later stages, by intermittent or continuous dribbling. At this stage the residual urine has reached several pints or more in amount and the musculature of the bladder wall has lost its contractile power and serves merely as a reservoir, allowing as much of the urine to flow away as has collected up to the level of the vesical neck and above that of the postprostatic pouch. This involuntary overflow is usually freshly secreted urine. The urine which constantly remains in the postprostatic pouch with no chance of voluntary expulsion serves as an ideal soil for the development of infection by the Bacillus coli and the staphylococcus. Here, also, commonly phosphatic calculi form and aid in producing cystitis.

In twenty cases, a careful bacteriological and cytological examination of the urine and the prostate gland was made, with the fact in mind that an ascending infection in the pelvis of the kidney must necessarily have its starting point lower down in the bladder. In this analysis Dr. A. Jersky collaborated. His untiring efforts rendered the available data and deductions therefrom possible.

Urine and prostatic examination.—From Tables I and II it will be seen that pus was present in nineteen out of twenty specimens examined. Bacillus coli was obtained in seven instances; Bacillus coli and Staphylococcus albus three times; Bacillus coli and Streptococcus once; Streptococcus albus five times; Streptococcus albus and aureus three times; and Proteus vulgaris once. The prostate alone was the seat of infection in three instances and was sterile in five. The urine alone harbored bacteria in seven instances and was sterile once. The prostate and urine were, simultaneously, the seat of infection in ten cases, but in none were they sterile in the same case. The predominating organisms, their frequency and association were, in order: Bacillus coli; Staphylococcus albus; Bacillus coli and Staphylococcus albus; Staphylococcus albus and aureus; Bacillus coli and streptococcus once and Proteus vulgaris once.

FIG. 1.—Extreme backward pressure produced by prostatic hypertrophy. Note extreme dilatation of both ureters and renal pelves and atrophy of renal secreting tissue.

It is surprisingly interesting to note that two organisms of such varied pathogenicity as Bacillus coli and staphylococcus albus should be the offending organisms in almost an equal number of cases.

Although under ordinary conditions Bacillus coli in the urine may be regarded as an organism of low pathogenicity it sometimes attains a high degree of virulence and may rapidly lead to the death of the patient as, for example, in peritonitis. In rare instances it is even associated with the presence of pus. Fortunately Bacillus coli rarely hinders the progress of a case of prostatectomy. Many attempts to isolate gonococcus were unsuccessful. This is against the hypothesis of some observers that an antecedent gonococcus infection is a factor in the development of prostatic trouble in later years. We likewise failed to isolate the new organism found and described by Dudgeon in 1906. Neither did we isolate Micrococcus neoformans described by Doyen in 1901 as occurring in prostatic and other tumors. In a series of forty-four new growths examined by Paine this organism was found eleven times, but there were no hypertrophied prostates in his series.

Renal function.—In recent years the many improvements in medical and surgical diagnosis of a disease, especially in its initial stage, are chiefly due to the great advance made by physiologists and clinicians in the knowledge of the normal and pathological function of the affected organ. The foregoing statement applies particularly to the kidney.

Renal sufficiency and insufficiency.—The diagnosis of renal disease was formerly made from an exami-

nation of the urine and of the anatomical and pathological condition of the kidney itself. The present method of considering also the sufficiency of the work performed by the separate sections of the kidney, has led to such important prognostic and therapeutic inferences that it will at once be recognized as a great step forward.

Since the introduction of catheterization of the

TABLE I

KIND OF ORGANISM	NUMBER OF TIMES PRESENT	PROSTATIC TUMOR URINE & EXUDATE	URIF	PROSTATIC TUMOR URINE & EXUDATE
BAC. COLI	7	0	2	5
BAC. COLI AND STAPHYLOCOCCUS ALBUS	3	0	1	2
STAPHYLOCOCCUS ALBUS	5	1	2	2
STAPHYLOCOCCUS ALBUS AND AUREUS	3	1	1	1
PROT. VOLG.	1	0	1	0
BAC. COLI AND STREPTOCOCCUS.	1	1	0	0
STERILE	6	5	1	0

ureters, the exact division of the secretion of the two kidneys has become a matter of only ordinary technical skill in the handling of the instrument. A pathologic change in the urine is the first sign of impaired function of the kidney. Uremia is the expression of the absolute inactivity of the kidney as a result of destructive disease of that organ or of complete obstruction of the urinary passages. Naturally derangement of the active renal parenchyma

TABLE II

causes each separate department of the specific work of the kidneys to suffer.

The chemical analysis of the urine.—This affords an insight into the renal functions of salt secretion and selection. A twenty-four hour specimen of urine from kidneys should contain salts in the following proportions:

	Gm.
Urea	21-34
Uric acid	0.2-1.24
Creatinin	0.8-1.2
Hippuric acid	0.3-1.1
Chlorides	10-15
Earthy phosphates	0.6-1.2
Total phosphoric acid	1.5-2.7
Sulphates	1.5-2.7

These figures have, of course, their shortcomings and in the opinions of Von Noorden and Ritter Roseman, Guyon, Albarran, Israel, Rovsing and Tuffier this method of examination falls short of our aim. They maintain that even in the healthy subject, a considerable retention of nitrogen may occur which is balanced afterward by a considerably increased excretion.

Microscopic evidence in urinary sediment.—This method of examination, in itself, is hardly fitted for judging renal activity. Often, however, it opens the way to the anatomical diagnosis of a renal lesion. A large number of observations have proved that even the discovery of renal elements in the urinary sediment need not be regarded necessarily as a pathognomonic symptom of an anatomical lesion in the kidney. Both after the palpation of healthy kidneys and in the socalled harmless albuminurias, casts and renal epithelial cells have been found in the urine when it has been impossible to assume a severe disease of the renal parenchyma. Fischer attempted to prove that by the piling up of acids in the kidney all varieties of casts can be produced experimentally.

Many methods of examination have been employed for the detection of renal disease, and the aim of all is at a functional diagnosis. I shall merely name most of them and dwell only on the two which have a direct bearing on this paper and which are indispensable, the most popular and the most extensively employed methods of today.

The various methods (old and modern) are:—1. Determination of the toxicity of the urine. 2. The estimation of the content of urinary pigments. 3. Cryoscopy, the estimation of renal function by determination of the molecular concentration of the blood —freezing point. 4. The estimation of the index of refraction of the urine. 5. Measurement of the electrical conductivity of the urine. 6. Coagulation time of the blood. 7. Method of experimental polyuria. 8. Methylene blue test. 9. Rosaniline test. 10. Potassium iodide test. 11. Sodium salicylate test. 12. Fuchsin, diastase, lactose, etc. 13. Indigocarmin test. 14. Phloridizin method. 15. Estimation of renal function by means of nephritic test meal (Hedinger and Schlager, Mosenthal). 16. Phenol sulphonephthalein test. 17. Blood chemistry analysis.

Phenolsulphonephthalein.—Abele and Rowntree have determined that this drug is rapidly excreted practically by the kidneys alone. The function of the kidney has a special significance in cases of enlarged prostate with retention. This retention can cause cystitis, dilatation of the ureters, varying grades of hydronephrosis or atrophy of the renal parenchyma. Infection invariably leads to pyelitis, a diffused or localized pyelonephritis, or pyonephrosis. These inevitable complications are often difficult of recognition and are overlooked. Owing to extremely favorable results, recent therapeutic measures tend more and more toward a radical suprapubic prostatectomy. This is less dangerous than the regular introduction of catheters, copious hemorrhages, onset of uremia and, most serious of all, malignant degeneration of the parenchyma of the gland. The basis for a successful result lies not only in a satisfactory condition of the patient, but in the sound functional condition of the kidneys. The phthalein test, a trustworthy guide in the correct interpretation of surgical

TABLE III

FOUR CONSECUTIVE EXAMINATIONS OF P.S.P. TESTS, BLOOD CHEMISTRY & PRESSURE IN 20 CASES OF PROSTATIC HYPERTROPHY.

CASE NO.	DURATION OF SYMPTOMS	NATURE OF TUMOR	WEIGHT OF TUMOR	AMOUNT OF RESID. URINE	3 Days Before First Stage						8 Days After First Stage						2 Months After 2nd. Stage						4 Months After 2nd. Stage					
					P.S.P.EST.			BL.PR.		BL. CHEMIS.							P.S.P.EST.			BL.PR.		BL. CHEM.						
					TIME MIN.	FIRST H.	2nd. H.	SYST.	DIAS	UREA	CREAT.	U.A.C.	TIME MIN.	FIRST H.	2nd. H.	SYST	DIAST	UREA	CREAT.	U.A.C.	TIME MIN.	FIRST H.	2nd. H.	SYST.	DIAST	UREA	CREAT.	U.AC.	TIME MIN.	FIRST H.	2nd. H.	SYST.	DIAST	UREA	CREAT.	U.AC.
I	3½	Fib.Ad	5½	15	I4	33	I4	I85	I25	39	2.	3.I	I6	I7	I0	I65	II0	I6	I.6	2.9	I2	34	I8	I60	II0	I4	I.7	2.5	9	35	I8	I60	II0	I4	I.4	2.3
2	4	Adeno.	3½	I2	I5	27	I2	205	I35	I9	2.I	2.9	25	I4	I0	I80	II5	I5	I.9	2.4	I0	38	I8	I80	I20	I3	I.4	2.1	I0	38	I8	I80	I20	I3	I.2	2.1
3	4½	Cyst.A	4½	I8	I6	28	I2	2I5	I40	34	2.4	3.I	24	I8	I0	I90	I20	I6	I.9	2.6	II	34	I6	I90	I20	I3	I.4	2.3	9	36	I4	I80	I20	I3	I.2	2.3
4	4	Fib.Ad	4	I6	I7	29	I2	I90	I35	34	2.8	3.6	26	I6	I0	I65	I20	I9	2.4	3.	I5	3I	I2	I75	I20	I6	2.	3.	I0	38	I0	I70	I25	I6	2.	3.
5	2⅔	Adeno.	6	26	I5	28	8	205	I40	43	2.8	4.	22	I2	I0	I70	II5	I8	2.	3.7	I5	39	I2	I75	II0	I8	2.	3.	I2	39	I2	I70	II5	I4	2.	3.
6	3½	Fib.Ad	5	I8	I5	28	I4	I95	I30	36	3.2	4.	22	I4	9	I60	II5	20	2.3	3.2	I4	3I	I5	I65	II5	I6	2.	3.	I0	38	I2	I65	II5	I6	2.	3.
7	4	Cyst.A	4½	I3	I6	24	I3	I95	I25	34	3.5	3.9	20	I7	8	I05	I05	I8	2.6	3.	I4	36	I2	I70	II5	I4	2.	3.	8	36	I2	I70	II5	I4	2.	3.
8	3	" "	5	I6	I4	28	9	I95	I20	43	3.3	3.6	28	I7	6	I60	II0	I7	2.6	3.	I5	3I	II	I65	II0	I2	2.	3.	I2	33	I0	I60	II0	I2	2.	3.
9	2¾	Adeno.	3¾	II	I5	26	II	I90	I20	4I	3.I	3.6	26	I7	I0	I65	II5	I6	2.7	3.2	I4	33	I2	I60	I05	I5	2.	3.	I0	35	I2	I60	I05	I4	2.4	2.6
I0	2	"	3	I4	I3	25	II	I95	I20	36	2.5	3.7	2I	I7	8	I60	II0	I8	2.	3.4	I4	34	I2	I65	II0	I6	2.	3.	I0	36	I0	I65	I0I	I4	2.	2.6
II	2½	"	I3	27	I5	26	9	2I5	I40	5I	3.5	4.	23	I9	4	I80	I20	I6	2.7	3.	I4	27	I3	I80	I25	I4	2.	2.6	9	36	I0	I80	I20	I4	2.	2.4
I2	6	"	II	4I	I6	22	9	2I5	I40	43	3.6	3.9	28	I6	6	I80	II5	I8	2.3	3.	I6	27	I0	I80	I20	I4	2.	3.	I0	36	I2	I80	I20	I4	2.	2.9
I3	6½	"	I3½	56	I5	26	6	200	I35	58	3.I	3.7	24	I6	8	I65	II0	I6	2.3	3.I	I5	29	I5	I65	II0	I6	2.	3.	I	37	I2	I65	II0	I4	2.	3.
I4	2¾	Myofib.	9½	3I	I2	28	II	I95	I20	38	2.9	3.4	28	I7	4	I65	II0	I5	2.I	2.6	I6	33	II	I60	II5	I5	2.	2.4	9	35	I0	I60	II0	I2	I.9	2.4
I5	I½	"	6	27	I5	3I	9	I95	I20	56	3.I	3.6	33	I6	9	I60	II5	I6	2.4	3.	20	39	I0	I60	II5	I6	2.	2.6	I0	40	II	I60	II5	I4	2.	2.6
I6	2	Cyst.A	3¾	I6	I2	3I	II	I85	I20	52	3.	3.5	20	I7	I0	I65	II0	I6	2.4	3.	I2	36	I2	I70	II0	I5	2.	2.4	9	38	I2	I70	II0	I3	I.9	2.4
I7	I¾	"	4	I8	I4	26	I2	I90	I20	44	3.I	3.5	2I	II	I0	I60	II0	I8	2.4	2.8	I0	34	II	I65	II0	I6	2.	2.I	8	37	9	I65	II0	I6	2.	2.
I8	3	Adeno.	7½	29	I3	27	I4	I95	I25	43	2.9	3.4	22	I5	I3	I75	II5	I8	2.4	3.	II	34	II	I75	II5	I5	2.	2.6	8	36	II	I75	II5	I4	2.2	2.4
I9	2½	Carci.	4½	I8	I6	3I	7	I85	I25	36	3.9	4.5	28	I7	6	I60	II0	20	3.6	3.4	DIED 5 DAYS AFTER SECOND STAGE.															
20	I¼	"	4	I3	I2	29	I2	I95	I20	4I	2.9	3.I	23	I6	8	I75	II5	I6	2.	2.4	II	34	I2	I75	II5	I4	2.	2.I	9	38	II	I75	II5	I4	2.	2.I

TABLE IV

SUMMARY TABLE OF THE PHENOLSULPHONEPHTHALEIN EXCRETION, BLOOD CHEMISTRY AND BLOOD PRESSURE.

	DURATION OF SYMPTOMS IN MONTHS	AMOUNT OF RESIDUAL URINE IN OUNCES	WEIGHT OF TUMOR IN OUNCES	PHENOLSULPHONEPHTHALEIN EXCRETION						BLOOD CHEMISTRY ANLYSIS GRAMS PER 100 C.C. OF BLOOD									BLOOD PRESSURE READINGS IN M.M. OF MERCURY					
				1st. TEST		4th. TEST		% GAIN		1st. TEST			4th. TEST			IMPROVED %			1st. TEST		4th. TEST		IMPROVED %	
				APPEARANCE MINUTES	TOTAL %	APPEARANCE MINUTES	TOTAL %	APPEARANCE MINUTES	TOTAL %	UREA	CREATININ	URIC ACID	UREA	CREATININ	URIC ACID	UREA	CREATININ	URIC ACID	SYSTOLIC	DIASTOLIC	SYSTOLIC	DIASTOLIC	SYSTOLIC	DIASTOLIC
AVERAGE	37	22	6	I5	38	I0	49	33	29%	4I	2.8	3.6	I4	I.9	2.6	66	38	28	I89	I33	I69	II4	II%	I4%
HIGHEST	78	56	I3½	I7	47	I2	56	89	I9%	58	3.9	4.5	I6	2.4	3.4	73	38	22	2I5	I40	I80	I25	I2%	II%
LOWEST	I5	II	3	I3	3I	8	43	33	39%	I9	2.	2.9	I2	I.2	2.	37	40	3I	I85	I20	I60	I05	I4%	I3%

risks, has not only supplied us with most valuable diagnostic and prognostic information, but has furnished the incentive to numerous investigations into the functional activity of the kidneys. Neglect to employ the phthalein test of the renal functions before every prostatectomy is today unthinkable. Rowntree and Geraghty have employed the test in one hundred cases of urinary obstruction, mostly due to prostatic hypertrophy. In the majority, the test indicated some degree of renal impairment. Studying the excretion of this drug in several hundred normal individuals after subcutaneous injection, they obtained the following results: the drug appears in the urine in five to eleven minutes; thirty-eight to sixty per cent. (average fifty per cent.) being excreted in the first hour after its appearance in the urine, and sixty to eighty-five per cent. in two hours, only a trace being present during the third and fourth hours. Referring to the excretion of this dye in the cases of hypertrophied prostates they maintain that if the commencement of excretion is delayed by more than twenty-five minutes and the quantity of the salt excreted in the first hour sinks below twenty per cent., the operation must be postponed and preparatory measures instituted. Repeated tests are the only guide as to the advisability of surgical procedure. There can be no antagonism to their view as to delay of surgical interference. Without extreme caution in the choice of an anesthetic and in the proper drainage of the bladder before the operation, a chronic prostatic is a poor surgical risk.

The degree of retention, to a certain extent, parallels the age of process. The prostatic cases in which surgical relief is sought are those showing a high degree of pyelonephritis. This is especially true for those cases where the patients are poor, live in unhygienic dwellings and lack the intelligence necessary for the use of the aseptic catheter.

A glance of Tables I and II will show that nineteen out of twenty patients suffered from a concomitant infection somewhere along the urinary tract. In my series of twenty cases of suprapubic prostatectomy the phenolsulphonephthalein test was employed four times on every patient (see Table III).

Limitations of phenolsulphonephthalein test.—The scope of this test is limited. Of equal, or even greater importance, is the estimation of the nonprotein blood constituents through blood analysis because the phenolsulphonephthalein test does not indicate the condition of the kidneys in retention of objectionable constituents of the body for a long period of time, so that it fails to show accurately metabolic changes as far as nonprotein nitrogen retention is concerned. This fact was illustrated chemically by Foster who reported a case of advanced kidney disease showing a normal phenolsulphonephthalein output yet the patient died. In any major operation, particularly prostatectomy, nephrectomy or nephrotomy, the prognostic information regarding the functional activity of the kidneys, which the estimation of blood urea, creatinin and uric acid will give, is indispensable.

The normal blood content of these three end products of nitrogenous metabolism may be given as: urea nitrogen, twelve to fifteen mg., creatinin, one to two mg.; uric acid, two to three mg.; all calculated per one hundred c.c. blood.

Early cases of interstitial nephritis are accompanied undoubtedly by an appreciable rise in the blood uric acid, although a rise in the blood urea can be taken as a safer sign of impaired kidney function. Creatinin appears to be more readily eliminated than uric acid or urea, and it is not, as a rule, until the blood urea has doubled or more than doubled the normal that there is a very appreciable increase in this purely endogenous waste product derived, apparently, from muscular metabolism. Cases with high figures for urea but without marked creatinin retention, generally show improvement under proper treatment, while a case in which the creatinin retention reaches 3.5 mg. per one hundred c.c. blood should be viewed with grave concern. The amount of creatinin excretion serves as a most delicate index for renal function. Along with the retention of these nitrogenous products there is, naturally, retention of other salts, chloride and phosphates. When phosphate excretion is diminished, bringing about an increase in the (acid) phosphate in the blood and tissues, an acidosis results which lowers the carbon dioxide combining power of the blood. These cases are poor surgical risks, unless the patient is operated on under local anesthesia.

SUMMARY OF RESULTS AND FINDINGS:

1. All the patients had resorted to catheterization more or less regularly at the onset of retention.

2. The patients varied in age from fifty-six to seventy-nine years.

3. The prostate weighed three to thirteen and a half ounces, the average being six ounces.

4. The majority of the patients (fifteen) had been entirely dependent on the catheter for fifteen months to six and a half years, and these were in broken health.

5. The blood pressure varied from 185/120 to 215/140; the average being 189/133.

6. Two patients suffered from asthma and chronic bronchitis and one of these died from hypostatic pneumonia five days after the second stage. In one there developed phlebitis of the right leg eight days after the second stage and recovered from it in three weeks. The probable cause was a septic embolus due to the packing of the prostatic cavity to control an annoying and persistent oozing.

7. Four patients had also vesical calculi and glycosuria.

8. The suprapubic route was the choice in all cases.

9. The first stage in all twenty cases, was done under local anesthesia (novocaine two per cent.).

10. Nitrous oxide gas and oxygen were used for the second stage in all cases.

11. The average interval between the first and second stage was nineteen days, the longest twenty-seven days and the shortest twelve days.

12. The average phenolsulphonephthalein output for first and second hours two days before first stage was thirty-eight per cent. The highest phenolsulphonephthalein output for first and second hours two days before first stage was forty-seven per cent. The lowest phenolsulphonephthalein output for first and second hours two days before first stage was thirty-one per cent. The average decrease in the amount of excretion of phenolsulphonephthalein eight days after the first stage was nineteen per cent.; the greatest twenty per cent.; the lowest eight per cent.

The average improvement in the phenolsulphonephthalein output two months after the second stage was twenty-seven per cent.; the greatest thirty-four per cent.; and the lowest twenty-two per cent. An explanation is necessary concerning the drop in the phenolsulphonephthalein eight days after the first stage. As soon as drainage of the bladder is established after preliminary cystostomy, there is a sharp reaction upon the secretory power of the kidney. This is accounted for by the assumption that as soon as the back pressure is relieved decompression of the parenchyma follows. (Table IV.)

13. The average stay in the hospital was forty-one days, the longest fifty-one, and the shortest twenty-nine.

14. In sixteen cases no drainage of the bladder was resorted to after the second stage.

15. Moderate bleeding after enucleation in four cases was an indication for drainage of the bladder after the second stage, through a medium sized rubber tube. This is essential for packing the prostatic cavity to control hemorrhage, as it keeps the bladder opening separated and so facilitates the introduction of a packing by the finger; also for aiding the easy expulsion of clots which may accumulate in the bladder from slow oozing; and, finally for preventing in some measure the infection of the wound. Heretofore, all cases were subjected to tubular drainage after the second stage for eight to twelve days. The wound was thus prevented from collapsing and from quick healing. The prolonged use of the drainage tube was responsible often for persistent suprapubic sinus. Experience has taught us (Mayo Clinic, Victoria Hospital, Montreal) that other things being equal, the wound fares much better if the bladder is not drained artificially after

the second stage. The adoption of his method resulted in absence of pain in the wound and in the complete comfort of the patient. He was able to sit in a rolling chair four days after the second stage, and his wound healed in ten to sixteen days instead of in three to six weeks.

16. Two months after the second stage the patient could retain urine in his bladder for two to three hours without discomfort. In all cases except three, the patients were free from nocturnal urination two months after the second stage.

CONCLUSIONS.

1. It appears from a bacteriological examination of tumors of the prostate that microorganisms cause inflammation which produces enlargement of the gland, but bacterial infection is a secondary event and similar to that which so often occurs in tumors elsewhere in the body.

2. A bacteriological examination of the urine may throw little light on an examination of the prostate.

3. There is no evidence to support the view that enlargement of the prostate such as is referred to in this paper is of gonorrheal origin.

4. There is complete relief from the symptoms after operation, no matter how many years the patient has been dependent on the catheter.

5. Sexual vigor, contrary to the general belief, is materially enhanced.

6. The operation of prostatectomy is a surgical success. By this is meant that in all cases of adenomatous enlargement of the prostate gland, when the operation is properly performed and the after-treatment closely supervised, an absolute and permanent cure results; the patient regaining his power of retaining the urine at will and passing it naturally.

7. There is no relapse of symptoms even with lapse of time.

8. Kidney function is enhanced materially and the entire organism is benefited to an extent equivalent to a rejuvenation of ten years or more.

A complete bibliography will appear in the author's reprints.

A Review of an Important Problem in the Study of the Growth and Development of Children

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In this age of great progress, when our attention is especially called to preventive medicine, every general practitioner of medicine should be specially interested in the growth and development of children. Here we have a field of study amply sufficient in its scope to demand the most careful work, the profoundest acumen of the most intellectual and talented of our profession.

In dealing with children we should always bear in mind that a mere familiarity with the general, morbid conditions that ordinarily belong to adult life is hardly adequate information for our purpose. That we are dealing with the anatomical structures and organs of these little ones in their formative state, and that the correlative relations of these organs, structures and physiological functions are more delicately responsive than are usually found in life of maturity should be discarded.

This is true, not only with regard to the highly sensitive nervous system with its phenomenal responses of reflex irritations, but with the sympathetic responses of the digestive tract, the glandular system and the delicate organs of internal secretion. Moreover, the correlative relations of the functions of these structures and organs are so delicately constructed that a disturbance in one of these is so often followed with disorders in others. Often several of these functional disturbances appear to be working in a vicious circle. This is especially true in some cases of thyroid insufficiency with its influence on the digestive tract (Barker). In such cases it is often difficult to be sure of the primary cause in this cycle of disturbances. In the light of this it is obvious that a careful study of the entire subject of sympathetic responses, involving the nervous system, organs of internal secretion, and the functions of the digestive tract is essential in fitting us to treat intelligently the numerous disorders arising from these sources in the early years of childhood.

In viewing this complex subject and the varied literature of the most noted specialists, one is often more confused in reaching definite conclusions than if his reading were a little less, and his personal observations a little more frequent and discriminating. Personal observations of reciprocal responses in the correlative relations of anatomical structures and organs of the body give us a degree of confidence in dealing with our patients that scarcely anything else can supply. It is through these personal, practical observations that we have, within the last decade, been able to make definite progress in dealing with some of the most important problems of the growth and development of childhood—yes, amid the numerous, hazy theories and dreamy speculations, mingled with complex, scientific experimentations, the plain, practical observations are at last coming forth—namely, that the growing child requires certain definite, nutritive substances for growth and development. When nature and environment do not supply these, artificial measures must be taken.

There is probably nothing that illustrates this more impressively than the organized efforts that are being taken on the goitre problem. For many years the thyroid gland has engaged the attention of the medical profession. Its relation with the other delicate organs of internal secretion has been a subject for complex discussions. Every phase of disturbance, organic and functional, has been studied

and classified with wonderful skill and accuracy, ranging from the most pronounced exophthalmic goitre to that of myxedema; and all these different phases have been studied in their relations to other diseases, functional disorders and sympathetic correlations of other organs, glands and anatomical structures. And yet, with all these scientific investigations and elaborate discussions, it is almost strange to see how slow we have been to put into common sense practice the most practical and useful observation in regard to the prime function of the thyroid gland; namely, that of iodine nutrition.

It is now an established fact that iodine nutrition is an essential ingredient in our food for the maintenance of health, and that iodine poverty is not only felt by the general system in various ways, but is the dominant factor in the causation of simple goitre, and in some cases, even other forms of goitre, throughout the country. Though evidences of many years standing in the support of this statement, along with a steady, progressive accumulation of additional evidence to this end were being considered and digested, no organized effort to handle the goitre problem in this country was crystallized until 1918, when the selective service regulations brought out the fact that northern Michigan and Wisconsin had a great public health problem to solve, since it was found that in the examinations of certain groups of registrants as high as thirty percent. were incapacitated for army service (Olin). Near this time the reports of Kimball Marine's work in Ohio, at Akron, Cleveland and other localities, attracted additional interest. And later, 1921, Leven's second paper on the prevalence of goitre created still greater interest in the medical profession. In this paper it was shown "that of 1,783 persons examined in Lake Linden, Mich., 1,146 had thyroid enlargement." Other investigations in Michigan later on, by Dr. Thomas Marsden and others at Iron Mountain, revealed the fact that out of the number examined in this survey fifty-four per cent. had perceptible thyroid enlargement (Olin). Again, in 1922, Dr. C. C. Slemons, health officer of Grand Rapids, instituted his survey in that city; and from this it was shown also that out of twenty-six thousand children examined thirty per cent. gave a positive thyroid enlargement (Olin).

While many goitre surveys were being made throughout the various goitre sections of the country, and the interest in the goitre problem was on the upward surge, other measures were taken to establish a relationship of goitre in these sections with the natural food supply in its ratio toward iodine.

In these investigations conducted by McClendon and others, after he had examined one hundred specimens of water from the various sections of the United States, and had studied the various goitre surveys that had been made, stated that he believed the amount of simple goitre in the United States varied inversely with the amount of available iodine in the food supply of the areas (Olin). Many other investigations conducted by other observers, when considered carefully, seem to support this view. Indeed, the preponderance of evidence brought out from these goitre surveys has established beyond question that simple goitre is almost invariably caused by iodine starvation, and this fact has impressed the leading officials of our boards of health.

Other boards of health have taken up the question and are trying to devise the most available way of administering to the public continuous courses of iodine treatment. Among the various measures devised for this purpose the administering of a small percentage of iodine in our table salt seems to be the most popular.

As has been suggested by a number of observers, however, the general public in each state, district or locality will have to be enlightened with widespread propaganda on the necessity for increased iodine nutrition before any general coöperation can be obtained. This course is now being adopted, and we look to the future with interest and hopeful anticipations of a grand success. Indeed, it is to be hoped that this coöperative move will be so widely and generally successful in its great object that the stigma that has long rested upon the medical profession, for the lack of practical application of its knowledge on iodine nutrition to the public welfare, may be removed.

Again, another view of this subject brings out this thought: though it is conceded that simple goitre is generally caused by iodine poverty in the food supply, iodine poverty does not always produce goitre. We may have many patients suffering from iodine poverty, ranging from every degree of hypothyroidism to a most pronounced case of myxedema, and still see no signs of goitre. In many of these cases we have various signs and symptoms of iodine deficiency with the appearance of a sort of selective action for other organs, glands and anatomical structures of the body, while eliminating all appearance of any connection with the thyroid gland. This being true it can hardly be said that even in the most pronounced goitrous regions that the percentage of goitre cases represents the number of persons suffering from iodine poverty; for the percentage of the latter must be much higher. When we apply these facts to the borderline states and districts, and especially to the nongoitrous sections of the country, the proportionate number suffering from iodine poverty, and still showing no signs of goitre, must be more marked.

Now, bearing these statements in mind, it seems to me that this public problem cannot be entirely shifted from our shoulders to our boards of health. Every general practitioner has an individual problem for himself; namely, the study and the detection of iodine poverty among his patients, and especially among the children who fall under his care. This number, as I have already suggested, will be proportionately large; and when we consider also the vast number in this country who are suffering from the results of some phase of latent syphilis and who need iodine nutrition or elimination, the number will be larger still. I do not wish to be understood, however, as advocating the administration of full therapeutic doses of iodine generally and indiscriminately to our patients; but I wish the reader simply to bear in mind the large number of our people, especially children, who are suffering from some degree of iodine poverty in their food supply or in their constitutional needs for a normal meta-

olic activity. And to this end I wish to make some suggestions, not so much upon demonstrable facts as upon the theory of probabilities:

Don't wait for the classical syndrome of myxedema, or of cretinism before considering the possibility of iodine poverty. You will seldom see these advanced conditions in your practice compared to the vast number that are not well marked, and yet, who need iodine therapy. I have found, by personal observations in my practice, that a large percentage of cervical adenitis in children is in need of iodine nutrition, especially in the form of calcium iodide. Of course, many throat specialists and bacteriologists will tell us that the enlargement of these cervical glands come from the lymphatic absorption of infected tonsils, adenoids or nasopharyngeal catarrh and other conditions, and in many cases they are correct. But even in a large percentage of these morbid conditions we often have in the patients a poverty of iodine nutrition, which lowers the patients' vitality and thus favors bacterial infection. Many times have patients applied to me for throat treatment, and were considering my advice to submit to a tonsillectomy when a few days' preliminary treatment with calcium iodide improved their symptoms so rapidly that they soon felt that a tonsillectomy was entirely unnecessary. To prevent such a decision from the patient I find that I sometimes have to withhold the calcium iodide treatment, in cases in which I consider a tonsillectomy advisable, until I have performed this operation. Indeed, it is often surprising to see how rapidly the cervical glands and, many times the tonsils also in children, will shrink and greatly improve under the calcium iodide treatment when administered with a nutritious diet, including oatmeal, eggs and milk, especially.

Returning to the suggestion of detecting in our practice such cases as suggest strongly the need of iodine therapy and yet do not give us what may be called a classical syndrome of iodine poverty (such as is found in cretinism and myxedema), I wish to call your attention to cases that present only one or two isolated symptoms that suggest the condition in question. 1. Notice carefully all children who have enlarged cervical glands. A small percentage of these will be tuberculous and will therefore require somewhat different treatment. 2. Note those who are quite fleshy, with a puffy, waxy appearance of the face. Notice also if these children appear dull, sleepy and rather inactive. Note also in such cases the action of the heart, and see if this is relatively slow and irregular. 3. Note such children as are weak, sluggish and are suffering from a most obstinate constipation, with a distended abdomen that is tympanitic. 4. Notice the eyes of a child and see if they are retracted, with a slit lid and show no animation; and notice if the skin seems rather coarse and dry, and if the child's hair has lost its lustre, and if the eyebrows are scant or absent. 5. Notice the condition of the fingers, and see if these are lacking in normal taper; also examine the teeth and see if they are notched, or are giving way, or showing parallel ridges on the incisors or canines, as we sometimes find in cases in which the parathyroids are also involved, with a calcium insufficiency (Barker). 6. Look carefully for any enlargement of the thyroid, and note if the patient is listless or shows any degree of indifference toward his environment.

Any of these symptoms when taken separately are not at all conclusive; but when taken collectively, give strong evidence of iodine poverty. Any two or three of these symptoms, however, ought to be carefully considered, and when in doubt of the real condition, a week or two of iodine treatment may reveal the nature of the case, or at least clear up the doubt so far as iodine poverty is concerned. Of course, this line of study does not exclude any laboratory work to assist us in confirming our diagnosis. I am only suggesting to the busy practitioner a course of practical clinical observations that ought to serve to put us on the right track, and not as a complete course of study in any given case. So let us use these suggestions as merely a starting point in our work of detecting among children iodine poverty in their food supply, and in their constitutional, metabolic activity.

In conclusion, I wish to say that the subject presents a great field for usefulness, and every general practitioner should be alert in his efforts to give his best talents in serving the children of this generation. Who knows how farreaching our efforts may be?

The author's references will appear in his reprints.

The Syndrome of Coffee*

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If caffeine were the only toxin contained in coffee, the effects of coffee and tea would be the same, but they are not and coffee does frequently produce symptoms that can not be accounted for by caffeine alone. It contains essential oils, fats, waxes, and glucosides, and from some of these substances, the toxins that produce the symptoms of coffee poisoning will, no doubt, sometime be isolated. Motor unrest, sleeplessness, and tachycardia may be produced by coffee, tea, and Coca Cola alike, but coffee has a syndrome of its own.

From thirty-six cases that I believe to have been coffee intoxication, seen in the Massachusetts General Hospital and in private practice, I have selected for report twenty, in which the symptoms have subsided on the withdrawal of coffee, thereby leaving no reasonable doubt of the diagnosis. I do not report the other cases because in them the diagnosis could

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not be verified by further observation, most of them having been seen only once.

In the twenty cases the symptoms occurred as follows: Vertigo in twelve, headache in eleven, nervousness in eleven, visual disturbance in six, insomnia in four, nausea in three, tinnitus in three, cardiac arrhythmia in two, abasia in two, projectile vomiting in one, acrosyncope in one, and anginoid pains in one. Cardiac arrhythmia may have occurred intermittently in some of the cases and thus escaped observation, as it is probably more frequent than my group of cases would indicate.

From my own data I should describe the syndrome of coffee as consisting of vertigo, headache, scotomata, and nervous irritability, with sometimes other symptoms produced by toxic effect on various parts of the nervous system, either central or peripheral. Most vulnerable is the vestibular system, as shown by the twelve cases of vertigo. When nausea has occurred in coffee intoxication, we do not know whether it has been produced indirectly by disturbance of the vestibular system or, more directly by irritation of the vagus; but the popular supposition that it is produced by irritation of the gastric mucosa by the tannin or by the resins of the coffee does not seem to be tenable. Visual disturbances have consisted of an appearance of clouds obscuring the field, of sparks, or of other scotomata, as in migraine. Tremor is probably from the effect of the coffee toxins on the basal ganglia. The headache may be localized as in neuralgia or in sinusitis, or diffuse, as in the variety known as sick headache. Headache and weakness or depression are the symptoms in coffee addicts that sometimes lead to drug addiction. Aspirin and acetanilide are commonly used to relieve the headache, while more coffee, or other stimulants, are taken to overcome the depression.

The following are some of my cases that illustrate certain points:

Case I.—S. M., an intelligent negro woman, aged thirty-four, had complained of headache, cloudy vision, nervousness, weakness, and a feeling of constriction in her throat for about a year. The headache was orbital. She was drinking only a wellknown brand of invalid coffee, not in excess. She had been treated for some time as a psychoneurosis, but without benefit. The invalid coffee was forbidden and six weeks afterward she reported that all of her symptoms had ceased, except the headache, and that was "not half so bad." Invalid coffee contains very little caffeine.

Case II.—F. J., a married man, aged forty, had vertigo every morning. Once in two or three months he had vertigo so severe that he could not stand, and at those times there was projectile vomiting. There was some temporal headache and objects appeared as though encircled by dust. The bowels were moving daily. He had left chronic otitis media and there was constant lowpitched tinnitus. He had been treated for two years in the Massachusetts Charitable Eye and Ear Infirmary and he had been treated in the catarrhal clinic of the Massachusetts General Hospital. The tonsils had been removed and the nasal septum resected, but no treatment had relieved any of his symptoms. He was drinking three cups of strong coffee a day. One month after giving up his coffee he reported having no more symptoms except tinnitus, which had almost ceased. In th case a group of symptoms suggesting an intracran tumor subsided on the withdrawal of coffee.

Case III.—D. W., chauffeur, aged fifty, had rhythmical tremor of the left eyelid, twitching the facial muscles on the left, too rapid to be a t and tremor of the tongue and hands. He had tw cups of coffee a day. This was given up, and tw months afterward he reported that he was cure

Case IV.—R. N., an unmarried woman, ag thirty-eight, a nurse, illustrates the relation of coff to the taking of drugs. She drank four cups black coffee a day and suffered from severe hea ache and scotomata. To relieve the headache o day she took, at 10 a. m., one thirtieth of a grain strychnine, one half grain of codeine, and five grai of aspirin. At 6 p. m. she fell, without losing co sciousness, but finding herself unable to use her rig arm and leg. There was dysarthria and some apha for four weeks and she could not walk for six weel Evidently she suffered an embolism or hemorrha as a result of overstimulation, as she now has a slig hemiplegia. The urine and the blood Wasserma were negative. The episode was a year and a ha before the time of reporting. She has drunk more coffee since that time and has had no mo headache, vertigo, or scotomata. The cause of t hemorrhage or embolism remains unknown.

When I speak of irritability, I do not mean me nervousness, but irritability as manifested by a normal emotional response. My series includes in viduals in all stations of life, and I have exclud all cases that seemed to be complicated by hyster My belief is that the symptoms of coffee poisonin not attributable to caffeine, are produced by some volatile substances that give the aroma to the fin grades of coffee, and that therefore the socalled bet grades are the more poisonous. As these volat substances may be partly eliminated by boiling, I b lieve that a cheap coffee, prepared by boiling, is le toxic than an expensive coffee prepared in the mo approved manner. When I have allowed tea as substitute for coffee, symptoms of the syndrome coffee have not recurred.

In the literature there is much about caffeine a little about coffee.

Bardier, Leclerc and Stillmunkes of Toulouse (studied glycosuria produced by adrenalin. Th found that in animals under nicotine, glycosuria w produced by adrenalin, but that in animals und caffeine, glycosuria was not produced by adrenali They concluded that the sympathetic system w paralyzed by caffein.

Freidberg (2) describes his method of detecti caffein in the urine by its power of contracting fibr of frog muscle, when in concentration as low as o part in 35,000.

K. Okushima (3) reports a study of the excreti of caffein in the urine after tea and coffee drinkin He found that its elimination, whether from tea from coffee, required the same time; for comple elimination, the required time being between ni and ten hours. He used the method of Freidber described above. He found that in persons who brains were unequally sensitive to caffein, elimin tion was nearly equal. From this I think we mu conclude that susceptibility to caffeine is not or

rily dependent on lowered renal function. From e other toxins of coffee I have sometimes observed nptoms a day after they have entered the body.

Kurt Brandenberg (4) writes on the results of ing up coffee. He says that it is not so unfor- nate as it seemed to be that because of the decline the mark, Germany has not been able to import as ich coffee as she formerly did. He enumerates the lowing symptoms in coffee addicts: vertigo, xious feeling, weakness, weak spells, agitation, and heavy feeling in the heart. He says that some cases present the picture of angina pectoris. He does not mention scotomata and tinnitus.

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Endocrines in Relation to Rheumatic Fever and Rheumatoid Arthritis

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(*Concluded from page 670*)

IOLOGICAL AND THERAPEUTIC SIGNIFICANCE OF THE COLLATERAL PHENOMENA OF RHEUMATOID ARTHRITIS

Much interest and I think profound etiological sig- icance attach to the fact that cases of rheuma- d arthritis, presenting none of the cardinal symp- ns of exophthalmic goitre, nevertheless exhibit ny of its socalled secondary features. Thus, pig- ntary changes, suggestive of adrenal implication cur often on face, neck and limbs, and such may ecede the appearance of joint swellings, in a limb. Scleroderma is relatively common, also edema, ed, transient and of irregular distribution. Sub- ctive feelings of heat, profuse palmar and plantar eatings, dermographism and extreme emaciation e common to both maladies, as also lowered sugar lerance and a tendency to glycosuria.

The fact that cases of rheumatoid arthritis, in the sence of Graves's syndrome, yet display these sec- dary phenomena is very arresting. Is it not a clear dication that the arthropathies are but one feature a widespread constitutional or neuroendocrine dis- der? Have we not here a clue to the implacable ture of the malady? At first in rheumatoid arthri- the joints are swollen, spindle shaped, but ulti- ately they shrink—just as the skin of the ex- mities previously edematous and sweating, event- lly undergoes atrophic changes, becomes smooth, hite, hairless and in long standing cases, indis- guishable from scleroderma. The explanation, believe, is that in rheumatoid arthritis, as in rheu- atic fever, the preexisting and underlying hypo- yroidism is masked during the early stages of the sorder by coexisting Graves's syndrome, or (as oates and Gordon[1] have recently emphasized) by symptoms of hyperthyroidism with signs of sympathetic excitation; while in the later stages of the disorder signs of hypothyroidism again become insistent with its associated sympathetic depression.

Only in light of those cases in which Graves's syndrome and rheumatoid arthritis coexist are we enabled to grasp the significance of the collateral phenomena of the latter disorder, eloquent as they are of occult endocrine disturbance, indicative not only of thyroid but *qua* pigmentation of adrenal involvement also. Their lowered sugar tolerance suggests also pancreatic insufficiency while the frequency with which rheumatoid arthritis like Graves's syndrome arises after pregnancy or at the menopause is suggestive of ovarian disturbance. Obsessed all too often with the joint swellings, we overlook not only the etiological significance of the collateral phenomena but also the therapeutic indications. Small wonder then that eradication of septic foci and vaccine therapy so often prove lamentably disappointing. But if to these be superadded thyroid or other endocrine therapy, how encouraging are the results!

Thyroid therapy is indicated in cases presenting Raynaud phenomena or solid edema of the legs. In examples dating from pregnancy or prolonged lactation or those with preexisting toxemic goitre, as also in coexisting Graves's complex and rheumatoid when solid edema supervenes through thyroid exhaustion.

That lowered sugar tolerance frequently exists in these chronic arthritides is well established and restriction of the carbohydrate intake often does good. But although I have advocated and practised it for years, I question if it represents the best or the most we can do. We diminish the carbohydrate load to meet the deficient capacity, but why not raise the capacity to deal with carbohydrates? I prescribe thyroid and pancreatin, but I often think that here a trial should be given to insulin. For I have seen rheumatoid arthritis develop within two years of an operation for acute pancreatitis. Again, in instance marked by pigmentation asthenia and low tension pulse, a trial of adrenal therapy seems indicated, especially if there be obstinate joint effusions in which

[1] Vincent Coates and Gordon discussing the clinical features of eumatoid arthritis observe: "Clinically there are many signs of hyper- roidism. Excessive sweating, fibrillary twitchings, a tendency to ordered action of the heart and overbrisk tendon reflexes are met h, and there is often that nervous instability and misapprehension ich is associated with disordered endocrine function. The vasomotor tem is markedly upset, with flushing and even demographia; or a dition of the extremities approaching Raynaud's disease may be nd. The skin shows trophic changes, comprising loss of subcu- eous fat and a glazed appearance with loss of hair."
While the bulk of the symptoms are clearly attributable to hyper- roidism, it is obvious also that the trophic changes in the skin with s of hair, are due to the reverse condition—hypothyroidism. In this mmingling of states of hyper- and hypothyroidism in rheumatoid hritis there is nothing unusual.

adrenalin has proved most beneficial. For these are the lines along which I feel sure a more hopeful era of therapy will dawn for the unhappy rheumatoid patient.

OSTEOARTHRITIS AND ENDOCRINE DISORDERS

I have seen osteoarthritis coexisting with Graves's syndrome and others have recorded the same, but it is rare. The sequence—Graves's syndrome, myxedema and then osteoarthritis of knees and ankles has been observed.

On the other hand, the coexistence of osteoarthritis with goitre is not uncommon, and in my work on *Arthritis Deformans* I stressed the extreme frequency with which osteoarthritis of the knees—in women at the menopause is associated with partial or complete myxedema. Lastly, the overlapping of the specific lesions of osteoarthritis and acromegaly is of interest in view of the frequency with which changes in the thyroid and pituitary occur in the latter affection.

SUGGESTED IDENTITY OF ARTHRITIC AND SUBTHYROIDIC DIATHESIS

The intimate interactions, alternations and coexistences of the foregoing arthritic diseases with endocrine disorders has convinced me that the latter form the core—so to speak—of the arthritic diathesis. For myself I believe that the arthritic diathesis is synonymous with the subthyroidic diathesis. Thus, as we have seen, signs of subthyroidism are prominent features of the rheumatic child and as a man can no more escape from his diathesis than from his temperament, the same forms, I feel sure, too, the pathological substrate of the rheumatic fever which the child but too often develops after puberty. True, the symptoms of rheumatic fever may for the time mask the subthyroidism, but subsequently thereto it comes again to the surface and forms—as I believe—the interconnecting link between the rheumatic fever and a subsequent rheumatoid arthritis. Fortunately in the majority of instances rheumatic fever is not followed by rheumatoid arthritis and in them we may assume that endocrine equilibrium is more stable or more probably they lack or are unexposed to those agencies, environmental, infective or others that tend to depress endocrine activity. The menopause is a period of endocrine instability, hence presumably the reason why osteoarthritis so often arises at this period. Moreover, signs of subthyroidism are often present, in gout, and as that great physician Goodhart remarked—the frequency with which gouty subjects give a history of rheumatic fever in early life is highly suggestive.

In furtherance of my contention that a subthyroidic substrate is at the root of rheumatoid arthritis, I would cite two dramatic instances. Thus in a case of Graves's disease under Pauchet a thyroidectomy was performed and consecutively a state of rheumatoid arthritis with scleroderma supervened, which, however, relented to thyroid therapy. Again, Peppo Acchiote cites the case of a woman aged twenty-eight with hypertrichosis of chin and neck. It was treated by exposure of the affected region to x rays and coincidently a condition of rheumatoid arthritis and myxedema ensued and was well established after the eighteenth seance. Proving rebellious to antirheumatic treatment, Acchiote resorted to thyroid therapy which resulted in the dramatic clearing up of the co ditions. These examples afford almost experimen proof that partial thyroid ablation, or thyroid atrop following irradiation through the subthyroidism duced—may determine the onset of rheumato arthritis, and incidentally suggests the reason w scleroderma is relatively common in former malad The same sequence as we have seen may follow th roid exhaustion following preexisting Graves's sy drome or other thyroid exhausting factors. Here a we find an explanation of those hitherto unexpl able but wholly authentic instances in which rheum toid arthritis has ensued suddenly after acute frig viz., the depressing effect of such psychic factors the functional efficiency of the thyroid. I cann close this section more pertinently than with a qu tation from Mutch's masterly study of *Alimenta Infections* in two hundred cases of chronic arthri Thus he observes: "Chronic infection frequen damages the thyroid gland. In the present ser minor forms of subthyroidism were very comm while welldefined myxedema or goitres of consid able size were seen in fourteen per cent. of the cas There is an intimate association between immun reactions and the functions of the thyroid glan The dry extract of the thyroid was given in all su cases with great benefit to the joints."

RHEUMATISM AND GOITRE

Chomel long since said that rheumatism was r either at the Poles or at the Equator, but preval throughout the Temperate Zone, and especially hum or low lying alluvial or marshy districts. That it not entirely a matter of latitude is shown by great difference in incidence of the disease in d tricts of the same country. Such discrepanci moreover, obtain in regard to places, which in matter of climate and exposure are practically iden cal. It seems obvious, therefore, that other fact are concerned and there is some reason to believe t relative differences in soil occur in augmenting decreasing the liability of the inhabitants to rh matic manifestations.

At the same time it must be confessed that possess little or no exact information. But ex rience has shown that where predisposed persons actual sufferers from rheumatism migrate from rheumatic locality they often lose their rheumati just as goitrous subjects lose their goitre when th move to a nongoitrous locality.

As to soil, the belief that rheumatism is associa with limestone formations with their frequent c relate hard water is widespread among the laity a it is worthy of note that such geological formati are, if not exclusively, at any rate favorite hau of goitre. Again, though goitre evinces a predil tion for mountainous regions, we must recollect— Berry points out—that it is rare or unknown in Scottish Highlands and in Norway, and further, he observes: "speaking generally it may be said t goitre is more often found at the foot of a hill mountain than near the summit." In keeping w this, it is now well established that goitre is extrem common in low lying alluvial or marshy distri abutting on canals, rivers or estuaries with their bility to floods, and are not these precisely the regi where rheumatism in all forms abounds?

Seasonal incidence.—Both here and in the United States rheumatic fever, and in children endocarditis and carditis, tend to appear in the spring, and we may well ask—why this periodicity? The same holds good of tetany, too. Again, as McCarrison points out, new cases of goitre arise and preexisting goitres swell during the spring. Spring connotes chemical changes in the blood and endocrine glands—notably the thyroid. Thus the blood content of calcium and inorganic phosphates is at its lowest ebb in May—so, too, the iodine content of the thyroid. Is not this synchronous seasonal incidence of rheumatic fever, tetany and goitre somewhat striking, having regard to the clinical affinities of rheumatism for tetany and tetany for goitre?

Influence of sex.—In endemic goitre McCarrison states that up to the age of puberty goitre affects the two sexes almost equally. It is, if anything, more common in girls, but from the age of puberty onwards females are much more liable.

Turning to the recent valuable Report of the Ministry of Health on the *Incidence of Rheumatic Diseases,* one of the most striking facts elicited is the higher incidence of acute rheumatism (rheumatic fever) in insured females. Thus it states: "Not only are our insured females from sixteen to twenty-four attacked much more frequently (as 5:3) than the insured males of similar age, but that in the next age group twenty-five to thirty-four females are attacked three times as often." Later it states "our experience as to this higher incidence of acute rheumatism upon insured females is supported by the Leipsic statistics." Also if both acute and subacute rheumatism[1] be taken together the predominant incidence among women still obtains. The insurance ages for females being over sixteen, figures are unfortunately not available as to the relative incidence of rheumatism in children. But Poynton's statement that a female child with an hereditary rheumatic tendency tends to develop rheumatism more often than a male in the proportion of three to two seems to indicate that as in older subjects the incidence is higher in females than in males. Lastly, the findings re hereditary or familial liability are, the report states, "certainly consistent" with the "deeply grounded belief that acute rheumatism is a family disease." It may be added, too, that—contrary to general opinion—in muscular rheumatism the female attack rate is considerably higher than the male in every are group.

Passing to rheumatoid arthritis, the report states that its findings fully bear out Strangeway's statement that more than three women suffer from rheumatoid arthritis to every man. This is if anything an underestimate for taking 240 consecutive cases out of my series or rheumatoid patients, there were thirty-nine males to 201 females, a proportion of one to five or 16.25 per cent., and 83.75 per cent. respectively.

The findings of the report fully bear out the well established fact that the incidence of rheumatoid arthritis is higher in the childbearing decades, and contrast it with the relative infrequency of osteoarthritis during that period. They observe that after forty-five the female osteoarthritis rate equals the rheumatoid arthritis rate, while they add "the magnitude of the attack rate for osteoarthritis in older females when compared with the corresponding male attack rate is one of the surprises of the enquiry." This bears out my observation in 1909 that "the frequency with which in women osteoarthritis arises at or near the menopause is remarkable" (*7*), as also my statement that the knees are the common site (fifty-five per cent.). As to a previous history of acute rheumatism, the report found it in sixteen per cent. of the rheumatoid and in fourteen per cent. of the osteoarthritic group. A family history of rheumatism in forty-eight per cent. of the former and of the latter in forty-one per cent. of the females and thirty-two per cent. of the males.

In reviewing the foregoing findings the outstanding feature is the sex difference—the predominant incidence in females of acute rheumatism (rheumatic fever), subacute rheumatism, muscular rheumatism and, during or after the menopause, of osteoarthritis. In respect of goitre, too, we find the same preponderant incidence in females from childhood right up to the menopause with its maximum in the childbearing decades.

Now, the incidence of rheumatism in girls—as opposed to boys—between ten and fifteen, is heavy, and that of goitre also at this period, viz., at or near puberty. The incidence again, of rheumatic fever in the childbearing period is heavy, but much more emphatically that of rheumatoid arthritis, while at and after the menopause the incidence of osteoarthritis increases markedly.

It is clear then that these periods of increased incidence synchronize markedly with puberty, the childbearing decades and the menopause. In other words with those physiological processes—menstruation, pregnancy, lactation—which determine oft recurring or enduring hyperemia of the thyroid—while the heavy incidence of osteoarthritis at or after the menopause again coincides with the senile atrophy which overtakes the thyroid and ovary at this epoch. Needless to say the precise periods, too, at which new goitres arise, preexisting goitres enlarge, or at the menopause undergo involution, or become the seat of neoplasms.

Visualize these peculiarities in light of the subthyroidism of rheumatic children, the thyroid reaction during rheumatic fever, its frequent sequential hypothyroidism and its association with Graves's syndrome. Consider also the subthyroidism of rheumatoid arthritis, its occasional coexistence with Graves's complex, or commonly with hyperthyroidism and subsequent hypothyroidism, and to these add the—in my experience—invariable association of osteoarthritis in women with hypothyroidism, or myxedema, partial or complete.

View these also in light of the therapeutic test—the efficacy of thyroid therapy. That rheumatic fever in the children of actually goitrous subjects, or of the nongoitrous living in endemic regions, though rebellious to salicylates, yet responds if thyroid be superadded. It may be objected that thyroid swelling is not common in rheumatic fever, but how often is swelling or tenderness looked for? Moreover, the absence of noticeable swelling is quite compatible with a chronic process of hyperplasia in the thyroid—and this not rarely, judging from the frequency

[1]Definition of subacute rheumatism in report. Subacute rheumatism—a mild attack of acute rheumatism; pyrexia not exceeding 101°F. responding to salicylate treatment often accompanied by endocarditis without chronic joint deformities.

with which signs of subthyroidism subsequently ensue. On the efficacy of thyroid therapy in suitable cases of rheumatoid arthritis and osteoarthritis, I need not dwell, for they are well established.

Broadly speaking, the treatment of goitre and of rheumatic and rheumatoid affections shows a striking similarity. Iodine, iodine preparations, intestinal antiseptics, vaccines and thyroid therapy, not to mention change of residence, change of locality, water supply and so forth.

The clinical evidence then that these arthritic and endocrine disorders are intricately interwoven is undeniably cogent, reinforced as it is in the sphere of therapy. Inevitably it suggests the further possibility, viz., that the etiological factors responsible for their production likewise overlap or are perhaps identical. Indeed it has often occurred to me that the resemblances between goitre and rheumatism are somewhat striking. Both seem to me hereditary and very definitely familial in distribution. Both, too, I think may be regarded as place diseases, and though one hesitates to class rheumatism as endemic, it seems clear also, that our views as to the endemicity of goitre are undergoing attenuation or enlargement. We say in the same breath that goitre is ubiquitous, and yet we call it endemic. In short, as McCarrison, discussing its distribution in different countries, observes: "while the degree of endemicity varies, it would be difficult to declare any area to be goitre free." In others, as Berry remarks, "it is so widely spread over the whole country, while at the same time it is so slight, that it easily escapes notice, and cases of goitre are often considered to be sporadic which should be more correctly classed as endemic."

The present fashion of exposing the neck has revealed the unsuspected prevalence of goitre in young women and girls in London and other large cities. Does this predicate a low degree of endemicity (*qua* Berry)? Or are they to be regarded—as McCarrison suggests as examples of a simple toxemic goitre "to distinguish them from the goitre of endemic areas with which, however, they are closely analogous in origin?" But more pertinent to my subject is his statement "that toxemic goitre in the mother is of great importance in determining the production of congenital thyroid instability in the child. The symptoms of Graves's disease also may be superimposed on toxemic goitre." Seeing that thyroid instability is so marked a feature of the "rheumatic" child this previously unrealized prevalence of goitre takes on an added gravity and may have something to say to the heavy incidence of rheumatic fever in the methopolis as also, the frequency with which Graves's disease is met with in "rheumatic" subjects.

GEOGRAPHICAL INCIDENCE OF RHEUMATISM AND GOITRE

From this aspect the findings of the Ministry of Health regarding rheumatism are somewhat suggestive. Thus, the death rate from rheumatic fever and cardiac rheumatism is much higher in the north west and south west than in the east and south east counties. The standardized death rate through these disorders is highest in Lancashire and lowest in Norfolk. But Lancashire again, in this respect, falls below certain Welsh Counties, notably Glamorgan. But a very notable feature is the excessive incidenc of rheumatic fever and cardiac rheumatism in fe males in the City of Bristol.[1]

True the Report discloses the fact that the genera liability to endocarditis in females exceeds that o males but this only brings into greater prominenc its excessive incidence in Bristol.

Now, it is admitted that the Cotswolds, the Men dips and the Valleys of the Pennine Range are al noteworthy haunts of goitre. It is worthy of not then, that the greater portion of the City of Brist lies in Gloucestershire, the remainder in Somerset shire. In short Bristol is located in and encircled b two counties—noted seats of endenic goitre. Thus we find it frequently in the villages in the Cotswol valleys of Gloucestershire, anl upon the carbonif erous limestone of the Mendip Hills—the villag of Chiselborough has long been noted as the sea of endemic cretinism, now I believe, extinct. Agair the river Avon upon which Bristol stands rises in th Cotswold—coursing through parts of Wiltshire an goitre is certainly endemic in some of the village along its banks.

This overwhelming incidence of rheumatic feve and cardiac rheumatism in a city lying in a goitrou district, and this among the female population i arresting. Without statistics as to the incidence o goitre in Bristol itself, it would seem impossible t follow the matter further. But seeing the intimat association of rheumatic fever with intercurren thyroid swelling with Graves's syndrome an sequential hypothyroidism, and also the rebelliousnes to salicylates of rheumatic fever in the children o the goitrous or those resident in endemic areas, would affirm my belief that there is some deepseate connection between the exceptionally heavy incidenc of cardiac rheumatism in Bristol and the endemicit of goitre in its environs.

Turning to Glamorganshire, in which the deat rate is higher than even Lancashire, we find here als goitre is endemic along the Barry estuary, an according to Hirsch in many parts of Wales, whic is interesting seeing that the death rate in Merioneth Montgomery and Brecknock also surpasses Lanca shire. Nevertheless, in Lancashire too, Hirsc reports endemic of goitre at Bolton, Accrington, an other places, while Hutt recently commented on th relative frequency with which thyroid swelling found in school girls in Warrington. The incidenc of acute rheumatism also appears to be heavy i Nottingham and it is suggested may be related t "lowlying riparian sites on made ground"— common site for goitre and Hirsch states that goitr is endemic in the coal districts of Notts. Stretchin towards Derbyshire, a noted haunt of goitre. Un fortunately for our purpose there are no repor forthcoming as to the incidence of rheumatic diseas in Derbyshire. The lowest incidence of rheumatis is in Norfolk, Anglesey and Cornwall. As to goitr in the first named Berry states "it has been asserte

[1]Carey F. Coombs writing on the incidence of fatal rheumat heart disease in Bristol (*Lancet*, 1920 ii. p. 226) found the avera annual number of deaths from rheumatic heart disease defined his method was seventy-one (or seventy-three if chorea were include on an average population of 251,974, a death rate of 282 per millio which is immensely high compared even with Lancashire, and sufficient to show that even after allowance has been made for t increased number that his method would show compared with resul obtained from ordinary certification records, there must be a hi death rate from this disease in Bristol.

that part of Norfolk is affected. Some of the villages a few miles to the west of Swaffham, are, however, certainly not affected." As to Anglesey this authority was informed that goitre "is probably absent from the whole island" and as to Cornwall, I can find no record so presumably it is not a marked feature.

As to rheumatoid arthritis, there is some excess in the south western and south eastern parts of England, and of gout a striking excess. Of osteoarthritis the main excess is in males in the North Western Division and in the females in the South Western region.

Need for further inquiry is obvious, but it does appear to me that where rheumatism abounds, endemic goitre also prevails, for generally speaking, rheumatic affections seem more common and more virulent in those regions through which the valleys of the Cotswold, Mendip and Pennine ranges run. Moreover, if my contention be correct that the arthritis diathesis is but another name for the subthyroidic, then it is not surprising that these diseases, especially rheumatic fever and rheumatoid arthritis should be more common in goitrous districts. I would remark too that subthyroidism emphatically favors the effective action of the generally accepted determinants of rheumatic fever, viz., cold and muscular overexertion.

For subthyroidism implies intense sensitiveness to cold, also diminished catabolism and diminished elimination of waste products. As I have said the environmental conditions that make for goitre make for rheumatism and the decrease of goitre and cretinism in the valleys of the Savoy, Pyrenees, etc., in sequence to drainage of wet, marshy soil, and the making of regular water courses and the like renders it imperative that such should be undertaken on a large scale in areas of endemic goitre. The prevalence of toxemic goitre too, clearly indicates that routine examination of school children from this standpoint, with a view to its early treatment and to the end of preventing the hereditary transference of thyroid instability to such offspring as may come to them in later life.

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Epilation With Diathermy

A Preliminary Report

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One of the most trying problems in cosmetic dermatology is the successful management of hypertrichosis. The unfortunate sufferers of this disfiguring ailment fall an easy prey to the advertising quack who promise a cure but usually fail.

So far we only know of two methods in the treatment of hypertrichosis: the x ray and electrolysis. Unfortunately the x ray, while an excellent agent in so many dermatological conditions, fails here and should be thoroughly discouraged, as the dose, required to produce a permanent alopecia, must exceed an erythema dose and is therefore likely to produce skin atrophy and telangiectasias, which are much more disfiguring than the original condition.

The second method is epilation by electrolysis, which, if used properly, is safe but unfortunately not free from many drawbacks. The main objection, aside from the slow progress and considerable pain to the patient, is that in the hands of the average operator only fifty to sixty per cent. and done by a skillful man, perhaps seventy-five per cent. of all the hair treated is successfully removed in one sitting, the balance will reappear, as the needle, no matter how skilfully inserted into the hair follicle, does not always strike the hair papilla in order to destroy it. The time necessary for the treatment of one hair averages about a minute, so that hardly more than twenty to forty hairs can be treated in one sitting. This method is usually most discouraging. Any improvement on this method should thus be welcome.

For the last few months I have treated these cases with the bipolar current of a modern high frequency machine, using electrocoagulation. The needle is connected with one pole and another metal electrode is attached to the skin. The needle is then inserted in the hair follicle and the current turned on with a footswitch, after having set the machine, to give the smallest possible spark. A current of about 80 milliamperes is usually sufficient. It takes about ten to twenty seconds for the successful removal of a hair, which is in almost one hundred per cent. perfect. The papilla is destroyed as the hair comes out without the slightest pull. The reason is that the coagulation spreads over a large enough area to destroy the papilla, even if the point of the needle does not touch it. By this method from seventy-five to one hundred hairs could be removed in one sitting and the percentage of recurrences is negligible. The pain is considerably less than caused by electrolysis. I have not noticed any scarring following the treatment.

CONCLUSION

While I have only used this method for a comparatively short time, I have been favorably impressed by its possibilities.

152 East 179th Street.

Practical Therapeutics

THE THERAPEUTIC RELATIONSHIPS OF DIGITALIS AND STROPHANTHUS*

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Digitalis and strophanthus have been classed as drugs with the same or a similar action. James Mackenzie, as late as 1920, in speaking of their action, said: "I could never in practice detect any difference" (1). In the general estimation strophanthus has been considered a sort of inferior digitalis, unreliable in its preparations and dangerous. Many years ago I concluded from clinical experience that notable differences existed in the actions of these two drugs, and that in some cases of heart failure strophanthus produced more favorable effects than digitalis. Writing in 1905, I said: "In uncompensated valvular disease in which the prognosis is bad as regards recovery of compensation, strophanthus generally acts better than digitalis. And in dilatation from any cause where the prognosis is bad strophanthus is usually more effective than digitalis" (2). And in 1911: "It (strophanthus) is much more useful than digitalis in the myocardial conditions produced by the acute infections, and it is often of great value, if used cautiously, in the chronic degenerations of the myocardium" (3). And in 1917: "The general indications for the use of strophanthus are those of a direct heart stimulant" (4).

The establishment of the proposition that digitalis and strophanthus differ radically in their therapeutic action depends on getting a certain amount of positive knowledge. Lately such knowledge has become available, and Vaquez was able to say in his textbook of diseases of the heart, published in 1924, when speaking of cases of heart failure over which digitalis had lost its efficiency: "We are obliged to admit that there has intervened some new factor which escapes the influence of digitalis. This factor, over which the drug has no control, is loss of myocardial tonicity; for, speaking physiologically, digitalis is not a heart tonic, as it has often been called. Therefore, it is necessary to search for other substances possessing a more energetic action on the tonus of the heart. This action is possessed in a high degree by the strophanthins" (5). This statement of Vaquez suggests an explanation of the differences observed clinically between the actions of digitalis and strophanthus.

Before discussing further the clinical aspects of the subject, let us review briefly the physiological action of these two drugs.

PHYSIOLOGICAL ACTION OF DIGITALIS AND STROPHANTHUS

Much study has been devoted to digitalis since Withering's notable monograph appeared in 1785, but our knowledge of its physiological action is far from complete. These facts seem to be established: Digitalis is slowly absorbed from the alimentary tract and slowly eliminated or destroyed. It acts on the heart in two ways, directly on the myocardium, and indirectly through stimulation of the vagus nerve and the two elements of its action vary absolutely and relatively to each other with the dose and the condition of the patient.

Describing its effects generally, we may say that in therapeutic doses it regulates the heart's action and improves the circulation in cases where such regulation is needed and the heart is in a condition to respond. In conditions where the heart is acting normally it appears not to slow or otherwise modify notably its action or to change the volume of the circulation; probably because the natural compensatory mechanism nullifies the disturbing effects of the drug. Describing its effects more particularly we may say that it acts directly on the myocardium to increase excitability and to diminish conductivity and indirectly through the vagus nerve, which it apparently stimulates at its cerebral centre, to depress all the myocardial functions. Its direct effect in increasing excitability may be nullified to a certain extent by its indirect depressing effect through the vagus in some of its stages, but it has been affirmed that extrasystoles can be produced by stimulation of the vagus, and Wilson says, "The arrhythmias occur when vagus and sympathetic are both active" (6) and strong stimulation of the vagus may cause its exhaustion with resultant sympathetic preponderance; and certainly extrasystoles are commonly produced by large doses of digitalis. If it directly stimulates contractility, which has been denied, such effect is apparently nullified by its depressing effect through the vagus. It seems not to increase tonicity or the "energy to contract" of the heart muscle. Robinson quotes Wenkebach as saying: "There is no evidence that the drug acts on the obscure property, tone of the muscle" (7) Robinson also quotes Mackenzie as saying that he, the latter, "was unable to determine that the drug affected the heart muscle."

The effect of digitalis in diminishing conductivity, which plays the chief part in its therapeutic action, is produced by both its direct action on the myocardium and its indirect action through the vagus. This effect is determined to a certain extent by the condition of the myocardium.

When digitalis is given in doses large enough to produce toxic effects, certain characteristic symptoms appear, which are, particularly, gastrointestinal, cardiac and renal. Headache is also a symptom, and may appear early. The gastrointestinal symptoms, viz., anorexia, nausea, vomiting and sometimes diarrhea, are usually the earliest to appear, although the cardiac or renal may appear before them. The first symptom of toxic effect on the heart is usually the occurrence of extrasystoles, which may appear occasionally or come so close together as to produce coupled rhythm. Heart block appears when the depression of conductivity has reached a sufficient degree in relation to the condition of the conducting tissue. Auricular fibrillation and alternation of the heart have been noted as toxic effects, especially in cases predisposed to those arrhythmias. Slowing of the heart's rate is not necessarily a toxic manifes-

*Read before the American Therapeutic Society, Atlantic City, N. J., May 22, 1925.

ion unless it should reach a point below normal. In regard to the effect of digitalis on the blood essure, Robinson quotes Eggleston as concluding at "there is no evidence that either digitalis or gitoxin has any direct effect on the blood pressure nen given to men, even in large therapeutic doses." have observed the hypodermic administration thirty-six hours of the equivalent of 105 minims a standardized tincture of digitalis to be attended th a fall in systolic blood pressure of twenty millieters of mercury, the diastolic pressure remaining nstant, and an increase in the pulse rate. When ven in doses large enough to produce death, the st stage of its action, as observed by Robinson and Vilson with the aid of the electrocardiograph, shows ntricular fibrillation (8).

The amount necessary to bring about beginning xic symptoms is stated by Levine and Cunningam to be between twenty-seven and sixty four per nt. of the lethal dose (9).

That the physiological action of strophanthus ffers radically from that of digitalis appears in the escription of it given by Vaquez, who says: Strophanthus is above all a heart poison, on which rgan it has a remarkable action. Soon after the dministration of a lethal dose, the heart beats more owly, the ventricles contract more and more, their utput diminishes and death ensues when the heart, gid, contracted and empty of blood, stops on acount of excess of function. The influence is exted first on the ventricles; the auricles resist longer. inally, it has been proved that the arrow poison cts on the myocardium itself and not on the nerve laments. The arrest of the heart does not depend ither on the intervention of the pneumogastric or f the medulla or cord. . . . Strophanthus, nen, is the heart medicine *par excellence,* the effects f which are exerted exclusively on the myocardium vithout intervention of other factors. Perhaps it ffects conductivity also, as Jamieson has noted, by engthening the conduction time. . . . The limination or destruction of strophanthin is more apid than that of digitalis, but it is not known how t occurs. At all events, the substance is not evacuted by the kidneys, nor by the salivary glands, nor by the alimentary tract, and on account of its rapid disappearance it has no cumulative effect" (10). Vaquez also notes that the actions of strophanthin nd ouabain are identical. In addition to its action n increasing tonicity and depressing conductivity, trophanthus probably has some effect in increasing excitability. I have observed pulsus bigeminus to follow its use in large, continued doses.

Vaquez's statement that strophanthus does not produce any part of its effect through stimulation of the vagus seems to be supported by Cushny's observation, that while a rapid heart slowed by digitalis recovers a portion of its former rate after administration of atropine to block the vagus, a heart similarly slowed by strophanthine shows no increase in rate after administration of atropine (11).

If digitalis stimulates the vagus but does not increase tonicity and contractility, while strophanthus does not stimulate the vagus but does increase tonicity and contractility, the differences in action of the two drugs would seem to be radical, and the correspondences to be limited to increasing excitability and diminishing conductivity.

PREPARATIONS AND DOSES OF DIGITALIS AND STROPHANTHUS

The matter of preparations and dose is of prime importance. A good drug used in unreliable preparations or improper doses can fail to demonstrate its therapeutic value and mislead as to its qualities. This has been the case especially with strophanthus, which has been administered in improper doses; although the unreliability of its preparations is probably much less than has been asserted. The therapeutic dose of digitalis is more generally understood than that of strophanthus, and the variation in potency and stability of its preparations has been largely corrected by standardization.

As the therapeutic effect of digitalis is not produced in most cases until the lower limit of its toxic action has been reached, it is with the beginning toxic action that we have to deal. This dose, as stated previously, is modified by the pathological lesions present. In my recent experience the administration of the equivalent of 225 minims of a standardized tincture of digitalis (fifteen tablets of digipuratum of one and a half grain each), given in five days, produced anorexia, nausea, vomiting and pulsus bigeminus in a young woman with chronic cardiac valvular disease of rheumatic origin, without fibrillation but with inadequate compensation for the recumbent position; which was followed by cardiac dilatation, enlargement of the liver and death in about a week.

In another case I observed recently that no signs or symptoms of toxicity after the administration of 270 minims given in three days to a young woman with compensated mitral stenosis who had lobar pneumonia: the heart action continued good throughout the pneumonia and the patient recovered. And again, I recently observed anorexia, nausea, vomiting and a slow pulse develop in a young woman with mitral stenosis and auricular fibrillation, after taking 180 minims in four days. The patient weighed 108 pounds.

The fact that different amounts of the drug produce beginning toxic effects in different myocardial conditions is an argument against giving it in massive doses to produce quick digitalization, and in favor of giving it in moderate doses to produce gradually therapeutic saturation, so that early symptoms of toxicity can be recognized and the drug stopped.

Cowan and Ritchie sum up the situation as regards digitalis doses as follows: "Sir James Mackenzie recommends a daily dose of one dram of the tincture, divided into three or four doses. French writers advocate massive doses, but the repeated administration of the smaller doses seems to us preferable, as the minor adverse symptoms can quickly be checked by withdrawal of the drug. In our experience smaller doses than a dram may be sufficient" (12).

The rule for the administration of digitalis laid down by Withering in 1785 is as follows: "Let the medicine be given until it acts on the kidneys, the stomach, the pulse or the bowels; let it be stopped on the appearance of any one of these effects."

The question of its dose is closely connected with

that of its absorption, when given by mouth, and especially with that of its elimination. It has been shown that with good action of the kidneys, the equivalent of between twelve and thirty minims of a standardized tincture is eliminated in twenty-four hours, the average being about twenty minims. So in cases where it is desired to maintain saturation at a given point, this can be done, after that point has been reached, by administering daily a dose between those limits suited to the case.

DOSE OF STROPHANTHUS

The dose of strophanthus is a more simple matter than that of digitalis. There is here no question of cumulation; nor is there one of absorption, if the drug is given by the hypodermic or intravenous methods, or to any noteworthy extent, in my opinion, if it is given sublingually. And the dose does not have to be always of such a size as to produce the fullest physiological effect. Strophanthus being truly a heart tonic can be given in tonic doses of varying sizes to meet different indications, as well as in doses as large as the limit of therapeutic response. The dose of strophanthus should be the smallest that will do the work, while that of digitalis should be as large as the patient can stand.

STROPHANTHUS PREPARATIONS

Much has been said of the unreliability of preparations of strophanthus, especially the tincture, and the dangers that attend its use. In my earlier studies of strophanthus I used the tincture and had generally good results with it; now I prefer strophanthin, but I did not use either in the doses recommended in most publications on the subject. I have found by experience that doses considerably smaller than those usually recommended give the best results; and I am of the opinion that the failures to get good results with it and the accidents that attended its use were to a considerable extent due to its being given in too large doses.

It has been maintained that strophanthus given by the stomach is not satisfactorily absorbed. Whether or not that is so, in times past I have obtained what seemed to be good results from such administration. Now, having strophanthin, I do not give it by way of the stomach, but only sublingually, hypodermically, intramuscularly and intravenously.

The different strophanthins cause some confusion because they appear in amorphous and crystalline forms which have different doses. I have found it convenient to use one particular preparation the dose of which I have learned by clinical experience. This dose, as I have learned it, ranges ordinarily from grain 1/1000 to grain 1/250, given every four hours. The first mentioned dose is considered moderate and the second large. A full dose is grain 1/500, every four hours. In emergencies a single dose of grain 1/100 may be given intravenously or intramuscularly, after which no more should be given for twenty-four hours. The variety of strophanthin known as ouabain possesses the advantage of being crystalline and uniform; it is given in doses considerably smaller than the dose of amorphous strophanthin.

(To be concluded)

Treatment of Hay Fever.—Leo von Gord (*Schweizerische medizinische Wochenscrift,* M 15, 1924) states that inasmuch as the etiology hay fever is still uncertain there can be no speci remedy and therefore a detailed history of the in vidual case is of great importance. It should borne in mind, however, that the administration calcium may afford considerable relief and form t basis of future therapeutic and prophylactic mea ures. The author has obtained some very good r sults with it. With the administration of sufficie amounts he observed not only a diminution of t increased excitability of the nerves which produ the attacks of sneezing, but also an improvement the general condition of the patient and an increas power of resistance to various influences.

The best mode of administration is by mouth a the most effective calcium salt is the chloride. Wh a rapid and intensive effect is desired intraveno injection may be used. A ten per cent. calciu chloride (chemically pure) solution is given intra enously, or the double salt of calcium chloride ur may be used. Injection into the surrounding tissu should be avoided as such an injection will produ not only severe pain but also necroses.

Relations Between the Thyroid Gland and th Nervous System.—A. Oswald (*Revue Françai d'Endocrinologie,* August, 1924, vol. 2, page 23 enumerates and comments on the various points contact between these structures in respect of goit and hyperthyroidism, general nervousness, metabol divergences, psychic manifestations, insomnia, tach cardia, states of gastric disturbance and those hyperactive intestinal peristalsis. He emphasizes th evidence that administration of thyroid extract pr duces similar effects in individuals and anima whose nervous system is impaired, but not in su as are in complete health. Thyroglobulin, that iodized globulin, seems to possess the property sensitizing the nerves of the circulatory apparatu It likewise possesses all the other properties di tinctive of the gland and consequently must be i ferred to constitute the thyroid hormone. Since contains all the iodine of the thyroid gland, and sin all or nearly all the iodine is contained in the collo substance of the thyroid vesicles, thyroglobulin ma be considered a constituent part of this colloi Therefore, since the thyroglobulin is the thyroi hormone, the physiological proof is complete that co loid is the product of the secretion of the glan From the author's experiments he concludes th thyroxin has no sensitizing effect on the nervous sy tem. It does not increase the excitability either the vagus or of the splanchnic. It cannot therefo be regarded as the proper hormone of the thyroi gland.

Pharmacology of Benzyl Alcohol and It Esters.—Charles M. Gruber (*Journal of Laborator and Clinical Medicine,* January, 1925) states th benzyl alcohol and its esters, benzyl acetate and be zyl benzoate, increase the rate of urine secretio when administered intravenously, intramuscularl or intraperitoneally. The mode of action of th drugs in causing this diuresis has not been dete mined as yet.

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The First and Last Kink

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London

A quarter of a century has elapsed since I described this condition and called the attention of the profession to what I believe to be by far the most important evolutionary structure in the human body which has ever been observed, and one which is productive of very disastrous consequences.

I was led to the discovery and appreciation of the importance of this new development by a study of the changes which the body undergoes when its mechanical relationship to its surroundings is altered from the normal. I found that the human anatomy bears a simple definite mechanical relationship to its surroundings and varies rapidly with any change in that relationship. This I demonstrated in the clearest manner possible in the dissecting room of Guy's Hospital by the examination of the dead bodies of laborers who had been engaged during their lives in various arduous occupations. A careful investigation of the changes which their structure underwent in consequence of the special functions performed showed me that they were so characteristic, so definite and so precise, that from an examination of the anatomy of these laborers I was able to determine with absolute accuracy the life history of the individual, or in other words, the functions he performed during his lifetime.

The laws which I formulated as governing these changes are quite simple, and can be readily understood by a study of these labor conditions.

They are: 1. The skeleton represents the crystalization of lines of force. 2. Pressure produces definite changes. 3. Strain produces definite changes. 4. Without the presence of pressure or strain an old mechanism may be altered or an entirely new one developed. The resulting changes develop to meet the altered mechanical relation of the individual to his surroundings and economize the expenditure of nerve and muscle energy.

The principles which govern the mechanical relationship of the organism to the gastrointestinal tract, which is inside the body, differ in no particular from those that influence its behavior in its mechanical relationship to surrounding objects. *Precisely* the same laws apply in both instances.

The consequences which result from the habitual overloading of the end of the large bowel with at least twenty-four hours' accumulated contents (a condition which is practically universal in our state of civilization and is recognized as being normal) are met on the part of the organism by an attempt to control the excessive dilatation, distention and elongation of the portion of the intestine which is affected by that accumulation. The effort to establish this control is usually more or less successful, the degree of success attained varying with the vitality of the individual. The attempt to control these changes consists in the formation of acquired firm strong bands or membranes simulating peritoneum in appearance. These develop along the lines of strain on the under surface of the mesentery. They gradually secure, contract, and shorten up the mesentery of the iliac colon and finally grip the bowel itself, rotate it on its longitudinal axis and eventually fasten it to the floor of the iliac fossa. The alteration in the functioning of this portion of the intestine which results from the formation of these bands and their mechanical effect upon the mobility of the intestine lead to a corresponding degree of interference with the passage of material through the anchored and obstructed bowel. In civilization the consistence of the contents of this portion of the large bowel is almost always firm and may be often quite hard. This fact again increases still further the difficulty which is experienced in the passage of the fecal matter through the obstructed segment of bowel. In respect to this factor I need hardly recall to you that cancer of the large intestine is eight times more common in the left side of the abdomen than it is in the right side.

Here I would again remind you of another law which I have formulated, namely, that all changes that ensue in the body from an endeavor on the part of the organism to establish a mechanical relationship to abnormal surroundings at first serve a useful purpose, but later tend to shorten the life of the individual. In no instance is this law so true and so clearly illustrated as it is in the case

of what I call the first and last kink. The effect upon the entire gastrointestinal tract is in the first instance simply mechanical. Later it results in the contamination by septic organisms of the nutrient material dammed back and stagnating in the small intestine and stomach and in the terrible sequence of the innumerable morbid sequelæ which ensue in consequence of these mechanical and toxic conditions. When I first called attention to this kink and its consequences, the less observant and more conservative section of the profession denied their existence, and some isolated members, with that lack of courtesy which is so often associated with a corresponding want of comprehension, asserted that the kinks did not exist in the patient's body, but were present only in my brain.

The more intelligent section of the medical profession looked for and investigated the several kinks I had discovered and finding them began by debating their origin. Some believed that they were produced by inflammation, since they could not conceive an acquired band or adhesion arising in any other way. Others considered that they were congenital. Many observers, while recognizing them, were of the opinion that they did not exert any control over the passage of the contents through the anchored bowel. The simple manner in which they come about was not realized, for the obvious reason that the definite changes which the body undergoes when its mechanical relationship to its surroundings are altered from the normal had received little or no attention from the profession.

While in a considerable proportion of cases the organism has sufficient vitality to form these bands and to effect an obstruction limited to this area, in a number of feebler subjects, owing to a want of formative capacity, either no bands are developed or they are not sufficiently strong and rigid to secure the colon which escapes from their controlling influence. In consequence, the lower bowel becomes enormously elongated and distended. The puddling in the pelvis of this elongated and dilated distal portion of the colon produces a degree of obstruction to the passage of solid contents through it which is increased by straining in the effort to expel the motion. It is important to realize that the obstruction so produced is often much greater than that brought about by the limited and localized obstruction brought about by the acquired bands forming the first and last kink. The consequences of this type of obstruction differ definitely from those produced by the kink, in that throughout the length of the proximal intestinal tract little or no effort is made to control the elongation and distention of the colon, small intestine, and stomach, so that the ulceration and cancer of the large bowel, duodenum, and stomach, so common in the case of the first and last kink, due to a definite local constriction, do not occur. On the other hand, in this type, which may for convenience be called the atonic variety, the infection of the food supply which is accumulated in much greater quantity in the elongated dilated bowel, the consequent intestinal autointoxication and the changes resulting from it form a much more marked feature. All the mechanical changes I described have been confirmed radiologically by Dr. Jordan, who has studied the subject so closely for many years.

I need hardly again remind you of the disastrous sequelæ of the obstruction of the colon, either by the formation of bands or by an excessive elongation of its terminal segment. Briefly, they are inflammation of the mucous membrane of the tract ulceration, first simply septic and later often can cerous at the several areas exposed to constan impact or strain, infection of the intestinal contents the contamination of the food supply of the body the flooding of the circulation with organisms toxins and other poisonous bodies and the deterio ration of the cells of every tissue in the body, ren dering them liable to the invasion of the organism of innumerable diseases. As the result of m observations, which have now extended over man years, I am exceedingly impressed by the sequenc of cancer and intestinal stasis. In my opinion thes are two factors in the causation of cancer as w see it in civilization, namely, the mechanical an the toxic.

I have observed cancer imposed on the mechanica and toxic results of chronic intestinal stasis so fre quently that I am convinced that the sequence i not a mere chance.

I have been equally impressed by the absenc not only of cancer, but of all the other direct an indirect results of stasis, as we see them in civili zation in such communities as do not suffer fro chronic intestinal stasis.

TREATMENT

The principles governing the treatment which now adopt in these several conditions differ in n detail from those I formulated twenty-five yea ago.

In the milder cases of obstruction the lubricatio of the canal and the consequent softening of th intestinal contents by the free use of paraffin, o the principle of the flushing tank, are sufficient t meet the disability resulting from a moderate degre of obstruction. Suitable diet, kaolin and belladonn are most helpful adjuvants in that they control th spasm of the inflamed bowel and help to reduce th infection of the food supply.

In more marked obstruction the freeing of th anchored bowel by the careful separation from and from its mesentery of the evolutionary band and the accurate covering by peritoneum of an raw surface which may be left as the result o such separation restore the structure and mobilit of this portion of the bowel to the condition whic existed at birth and permits of the free passage o material through the liberated loop. The results o such a simple proceeding are very often extraord narily striking, the sufferer being frequently restore to health and to the full enjoyment of life with wo derful rapidity.

In most cases this procedure can be effected if th surgeon is perfectly familiar with the arrangemen of the bands, but in a certain proportion, owing t the extent of the acquired adhesions, it is difficu and in some few instances impossible to cover accu rately any remaining raw area by peritoneum. Whe this is the case the bowel is very liable to becom

fixed again by inflammatory adhesions to the floor of the iliac fossa and in consequence does not function properly.

When the obstruction to the passage of the intestinal contents is not due to acquired bands, but to an extreme elongation of the lower segment of the bowel, such disability can only be met by dividing the ileum and introducing it into the side of the pelvic colon or by means of a colectomy. As the elongation and prolapse of the rest of the gastrointestinal tract occurs in the feeble subject and is consequent upon the obstruction in the end of the drainage scheme formed by the very elongated and tortuous termination, to hope to remedy this condition of so-called visceroptosis by sewing up the prolapsed and dilated viscera is obviously futile, since the cause of the accumulation of material with its consequences must remain.

It is not my purpose to discuss at this time the treatment of the ulceration of the gastrointestinal tract, and the other conditions which result from the presence of the first and last kink, but wish merely to call your attention to the enormous importance of recognizing the causal relationship of all the troubles in the proximal bowel and of the deadly and farreaching results of the intestinal autointoxication necessarily associated with it.

In order to obviate the development of the changes I have described, the public must be taught the necessity of evacuating the large bowel three times a day. In the first instances this can only be secured by correct diet and suitable exercise. When the condition of obstruction already exists artificial means must be employed in addition to diet, etc.

The time has come when the medical profession must study the whole question of chronic intestinal stasis thoroughly and, realizing its importance, must endeavor by educating the people in proper habits and diet to obviate this acquired state which may almost be regarded as the normal in civilization.

In view of the generally acknowledged steady increase in the disease and death rate produced directly and indirectly by stasis I feel I cannot urge you too strongly to take the matter in hand in earnest and with the least possible delay.

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Remarks on Acute Postoperative Dilatation of the Stomach*

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The postoperative care of a patient in certain instances is just as vital as the operation itself. Sooner or later it is the experience of almost every practising surgeon to have to record as a failure the final results of a particularly satisfactory piece of work because of some error of judgment in the care of the case subsequent to the operation. There is what is termed conveniently a surgical crisis covering a period of about five days for every laparotomized patient. Whatever may transpire during this period usually determines whether or not the end results will prove satisfactory. Certain definite principles of postoperative treatment have become aligned with the development of present day surgery, that an error of judgment, failure to do the right thing at the right time, perhaps an error of omission or one of commission for which the surgeon may have to answer.

However, patients subjected to surgery in which the postoperative attention to detail cannot be questioned have developed sequelæ, the nature of which cannot reflect culpably upon the surgeon. The surgeon can be held accountable only when he has failed properly to interpret important diagnostic guides, or, having correctly interpreted them, his failure to act promptly and fearlessly at the right time.

Except for a few conditions, a postoperative complication is rarely difficult of recognition even in its incipient stage. There is, however, one condition that may arise, which unfortunately is by no means uncommon, whose seriousness and uncertainty of relief cannot be doubted. This condition is an acute postoperative dilatation of the stomach. In endeavoring to garner additional knowledge about this condition a survey of the more recent literature was undertaken. This survey was not particularly illuminating and proved to be more or less an elaboration of certain facts that had been recorded by earlier investigators. Nothing so far has superseded the clearness and instructiveness of Hilton Fagge's description given in 1872-73 in the Guy's Hospital reports. The recognition of this affection in reality dates from this description.

In my surgical experience I can definitely recall ten cases of acute gastric dilatation following abdominal operations. Of these ten patients so afflicted two died, death being directly due to dilatation. One of the deaths occurred rather early in my surgical career and left upon me an indelible impression. What I had gained from this case has proved of inestimable worth for me subsequently. It taught me to exercise the closest scrutiny of my patient during the surgical crisis, it stimulated me in my observations of the slightest suspicious symptoms and it encouraged me to act promptly.

In no condition is prompt action of more vital importance than in acute dilatation of the stomach. Immediate treatment should outweigh all other considerations. When the clinical picture of a gastric dilatation is analyzed the only part free from theory is the existing pathology, i. e., the dilatation of the stomach and the mobile portion of the duodenum. When Fagge wrote his views on this condition in such a classical manner, he scarcely mentioned the etiology. The thoughts he enter-

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tained about this particular phase of the condition can probably be surmised when a summary of the present status of opinions from a number of prominent observers is taken into consideration. It can be said that the whole etiological picture of acute dilatation is just as strongly befogged at present as it was at the time of its recognition. A fairly good inference can be gleaned as to how enigmatic the condition has appeared to observers by the various appellations applied to it. The most frequent ones encountered in the literature are: Arteriomesenteric obstruction; arteriomesenteric ileus; gastromesenteric ileus; acute paresis of stomach; postoperative gastric paralysis; gastroduodenal distention; and acute paralytic dilatation of the stomach. These appellations only reflect a difference of opinion as to the nature and cause of the complication. Such differences of opinion are merely personal equations and are rather prone to confuse than to elucidate.

When it is known that an acute gastric dilatation does not necessarily follow an abdominal section, that the condition may complicate an extraabdominal operation, that it may appear after injury or a burn and may evidence itself in the course of a debilitating disease, the etiological solution becomes strongly problematical.

The picture of an acute gastric dilatation presents phases from which at least some understanding can be gleaned as to its cause. Among the postmortem appearances we find of especial interest, next to the enormous dilatation of the stomach and mobile portion of the duodenum, a large quantity of gas, and a fluid, greenish grey or brown in color, that is seldom offensive. It is the presence of the gas and the fluid in such enormous quantities that has shrouded this gastric picture in such mystery.

That there is a certain amount of gas normally in the stomach is well known, just as there is a certain amount of gas in the intestinal tract. It seems to be a necessary medium for the perpetuation of visceral motility. The origin of gas in the stomach cannot be definitely explained. It is assumed to be an admixture of air which has been swallowed, duodenal gas that has been eructated through the pylorus, or, finally, an end product of stomach chemistry or of gastric metabolism.

In conditions where shock, ether and toxins have inflicted their agencies upon the system a reversed peristalsis is not unusual. Such an antiperistalsis would cause duodenal fluids, and perhaps fluids from the more distal intestinal tract, to regurgitate into the stomach. The stomach is not able entirely to relieve itself of this accumulated fluid and the residuum becomes excellent material for saprophytic action. In this manner I believe much of the additional gas is formed during the initial stomach disturbance.

Subsequent stages of acute dilatation depend upon the behavior of the stomach. If there is sufficient tone in the viscus to cope successfully with the irritating influences that are harassing it, restoration to normal will take place. If, however, the stomach is not able to meet successfully the action of certain injurious factors, the clinical picture soon deepens. In acute dilatation, especially in the fatal cases, undoubtedly two factors must be at work. It is my belief that an acute dilatation is more frequent than is assumed. The condition is existing and the patient recovers without the lesion having been recognized. Although it would appear that this morbid change in the stomach could be divided into two forms, a division would only mean that a subsequent complication of a more grave character had arisen. This assumption is apropos in the lethal issues.

An uncomplicated acute dilatation not often terminates fatally. It is the complication, the seat of which is found at the root of the mesentery and involving the fixed portion of the duodenum, that proves to be the dangerous factor. It is here that an arteriomesenteric obstruction with an abnormal resistance is produced which is usually successful in resisting all gastric efforts.

The question I have often put to myself is this: Can an acute dilatation and an arteriomesenteric obstruction exist primarily at the same time? In my reasoning I cannot answer the question affirmatively. I assume with some assurance that an acute dilatation can produce an arteriomesenteric obstruction and that the latter may be the cause of the former.

It is not only in a stomach where there exists a chronic insufficiency, where the disturbances of innervation have been severe, that an acute attack is prone to be superimposed; it is also in a stomach previously healthy; where a sudden motor insufficiency from the action of certain injurious factors may occur which might lead to an acute dilatation.

The condition in its incipiency is an uncomplicated one. When recognized early it can be relieved. If allowed to go unrelieved the intragastric pressure and the associated tension acting upon the already tonically shortened gastric musculature will, through bacterial activity, cause further distention and resultant displacement. This acute dilatation is the more common type and is usually late in manifesting a serious clinical picture.

It is the displacement of the stomach that usually complicates seriously the existing dilatation by forcing the small intestine into the pelvis, producing traction upon the mesentery and thereby causing an obstruction of the fixed portion of the duodenum.

The type of acute dilatation in which the duodenum is primarily involved presents a clinical picture identical with that just described. There is the difference, however: In the duodenal type the symptoms are more severe and are more pronounced at an earlier period. It is the type of acute dilatation which appears almost as soon as the patient has returned to bed. The condition has been appropriately termed arteriomesenteric ileus. It is not as frequent as the paralytic form, but is much more serious. This type of acute dilatation is usually a sequence of an operative procedure involving the removal of a large abdominal tumor. It has also been known to follow a short labor. The provocative cause of the duodenal obstruction can be found in the rapid loss of intraabdominal pressure and the sudden release of support to which the stomach and small intestines were accustomed. Such sudden intraabdominal changes can invite an equally sudden

escent of the small intestine into the pelvis that ıay cause a pull upon the mesentery sufficiently trong to obstruct the third part of the duodenum. ın obstruction of this character when maintained ufficiently long will through toxic action on the ympathetic nervous system impair the gastric tone nd cause an acute dilatation. Such a dilatation t its early stage can be accepted as a decompenation on the part of the stomach in its endeavor to vercome the obstruction.

Death in acute dilatation of the stomach results rom acute toxemia. This reservoir of toxicity is ormed by the part of the duodenum proximal to he obstruction. Among its own glandular secreions it receives the biliary and pancreatic secretions, land products that are unquestionably important actors in the causation of the rapidly fatal conseuences.

It may be recalled here that physiological investiation has established the fact that the stomach pparently absorbs very little. When its digestive vork is done, or when it has none to do, it passes ts contents rapidly into the duodenum, from the illi of which rapid absorption occurs. An experinent by Dr. Edkins (London) to demonstrate this oint consisted in ligaturing the pylorus in a cat. A many times lethal dose of strychnine, a drug o which cats succumb in the smallest dose, was ntroduced into its stomach. For several hours while he pylorus remained ligatured no ill results hapened; however, as soon as the ligature was removed the cat passed into strychnine convulsions.

This is important for surgeons to bear in mind when contemplating an operative attack upon a case of acute gastric dilatation. It is not the stomach that requires drainage, but the obstructed duodenum. This has been repeatedly demonstrated by the failure of a posterior gastrojejunostomy, an advocated surgical measure for this condition.

The clinical findings pertaining to the different phases of an acute dilatation all appear reasonably clear, excepting the enormous amount of fluid with which the stomach is so often encumbered. The evidence suggests that the hypersecretion is caused by an underlying disturbance of gastric innervation. In most cases the distention of the stomach is gaseous; however, in the cases which I encountered enough fluid was repeatedly siphoned off to cause one almost to forget about the gas. The astounding fact is that a deranged action of the hormones with the resultant loss of control of the secretory glands of the stomach could produce so copious an amount of fluid in so short a time. However, the chapter on the secretory function of the stomach is still greatly befogged so that it is not surprising that the cause of this pathological hypersecretion remains somewhat obscured.

When we consider the clinical picture with its syndrome we have one which is so classical that when once seen cannot be misinterpreted even by the casual observer.

The general condition of the patient appears as being serious from the first. He is pinched and careworn and looks as though he has aged suddenly. Collapse is noted in nearly all severe cases. The skin often is cold and clammy, the patient is restless, his pulse is rapid and thready and of poor quality. The eyes are sunken and hollow. Respiration is rapid and shallow, simulating air hunger. Among the earlier symptoms there is a heavy gnawing pain in the pit of the stomach, accompanied by vomiting of large quantities of fluid with very little effort but with no relief. This vomiting at first is of a projectile nature; later, however, as the fluid accumulates in greater quantity and the atony of the stomach becomes more marked, the character of the vomiting changes to the spitting up of mouthfuls of fluid during very short intervals. The systemic fatigue is evidenced by the constantly increasing pulse. The fluid vomited resembles root beer, but it can be greenish grey. In the earlier stages it is seldom offensive. Thirst on account of the rapid dehydration becomes intolerable. There is often a desire to urinate, but the quantity, if any, is very scant. The temperature rarely registers above normal and is frequently subnormal. By inspection and palpation the dilated stomach can usually be demonstrated satisfactorily through an abdominal wall that is free from tenderness and rigidity.

Clear as this clinical picture of an acute gastric dilatation may appear, there are several postoperative conditions the symptoms of which in part bear a close resemblance to those of acute dilatation and might lead to diagnostic error. These conditions are peritonitis, postoperative ileus and internal hemorrhage. Differentiation may be somewhat difficult at the outset of the disturbance; however, with a close study of the condition a definite conclusion should be reached without much delay.

Certain characteristics of gastric dilatation, such as absence of fever, perhaps a subnormal temperature, the absence of abdominal tenderness and rigidity, the frequent and copious vomiting of a regurgitant type, and the distinctive topography of the abdominal distention should prove most helpful factors in clearing up any existing doubt. However, if an uncertainty as to diagnosis still remains, the passage of the stomach tube will cause a temporary disappearance of the distention if the condition is an acute dilatation. For this procedure we are indebted to Kussmaul.

On account of the high mortality rate of this condition, sixty-three per cent. at best, it is apropos to speak of the postmortem appearances. These are in most recorded cases strikingly similar. A hugely distended stomach having the appearance of an enormous ovarian cyst and filling the whole abdomen is the most striking picture. The stomach is sharply bent upon itself and can be likened to a gigantic U with unequal branches. Its walls are thin and the mucosa hemorrhagic. The dilatation rarely involves the stomach alone, but also implicates the duodenum up to the point where the superior mesenteric vessels cross the viscus. This is the fixed part of the duodenum and it is here that the localized constriction with its grave influences has its seat.

There has been considerable controversy about the nature of this obstruction caused by the mesentery which incorporates the superior mesenteric vessels, because not sufficient evidence of a demonstrable character could be found at postmortem.

When we consider that the mesentery is purely a fatty bolster, the superior mesenteric vessels acting only as trabeculæ, it can be readily inferred how an occlusion of a fixed and soft viscus can occur without appreciable damage to its structures.

The condition could be readily likened to a blow on the head with a stuffed club. Such a blow can cause unconsciousness without visible injury to the soft parts. If a similar blow were dealt with a blunt instrument, evidence of damage to the soft structures would be readily discernible in most instances. Furthermore the fact must not be overlooked that an acute dilatation causes death usually in from two to five days. That, however, does not imply that a mesenteric compression has existed for so long a time. From my clinical observations I can assume that death results very quickly after the mesenteric compression has established a complete duodenal obstruction and that in most instances the time factor was too short to produce appreciable pathological changes in the obstructed part of the duodenum.

The treatment of an acute gastric dilatation resolves itself into two exigencies, viz., prompt recognition and prompt action. Inasmuch as the condition must be construed as an emergency immediate treatment must outweigh all other considerations. Siphonage of the stomach as advocated by Kussmaul and the postural form of treatment as advised by Schnitzler become imperative measures. If these two procedures are carried out judiciously, the patient's chances for recovery are augmented. The stomach must be relieved of its contents. Inasmuch as this viscus will refill rapidly, repetition of the siphonage must be resorted to at frequent intervals and continued until further accumulation has ceased. In one of my cases siphonage had to be continued for three days.

It must be borne in mind that in some cases the distention of the stomach may be so enormous that the tube will not reach the bottom of the viscus. Under such conditions there could be no siphonage. When such a state is suspected the patient's hips must be elevated to aid displacement of the fluid. The postural form of treatment is as important as the siphonage. Its theory appears sound especially when the mesenteric compression of the duodenum features as a serious factor. The patient is placed upon the abdomen, inclined a little to the right side, with the hips gently elevated. With a patient in this posture the pull upon the mesentery will be relieved or greatly lessened. With these attentions additional ministrations to relieve shock and to sustain the patient must be given.

SURGICAL TREATMENT

I wish I could feel more encouraged about surgical measures for an acute gastric dilatation. My experience with postoperative paralytic ileus has been so unfortunate that I cannot but harbor a feeling of apprehension in contemplating a surgical attack upon an acute gastric dilatation. It would appear that in the early cases life can be saved by siphonage. In those cases where the condition has not been recognized early, I can only entertain the greatest doubt for any surgical treatment. The patient usually is in such a severe shock that an operation would necessarily increase the amount of existing shock.

There are some cases, however, that present certain indications for operative intervention which are at least theoretically logical; however, the mortality where an operative measure was undertaken by most excellent surgeons has been so high (eighty-five per cent.) that one cannot but feel that the condition is not one for operation.

UNIVERSITY CLUB BUILDING.

Diaphragmatic Hernia*

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True diaphragmatic hernia is a surgical condition that is rarely seen, and still more seldom diagnosed before operation. For a proper appreciation of its etiology, pathogenesis, and the failure of making a preoperative diagnosis, an anatomical review is necessary.

The diaphragm is a fibromuscular partition separating the thoracic and abdominal cavities. It is a domeshaped muscle which attaches to the distal margin of the thorax and upper lumbar vertebræ. The central portion is an aponeurosis and is known as the central tendon. The diaphragm is innervated by the phrenic nerves. It is not a complete partition, inasmuch as it is pierced by bloodvessels, nerves, and the esophagus. These structures pass through or are formed by the three crura of the diaphragm, which are subdivisions of its lumbar portion.

The important openings or perforations are: 1. That by the inferior vena cava, which passes through the central tendon, slightly to the right of the midline. 2. That by the aorta and thoracic duct, which is formed by the separation of the two medial crura. 3. That by the esophagus, which is formed by the division of the right crus, but sometimes is formed by the right and left crura, the esophagus passing between these two structures. 4. That by the superior epigastric vessels, which pass between the sternal and costal portions of the diaphragm.

The diaphragm has two serous surfaces, thoracic and abdominal. Its thoracic surface is covered by pleura, except the central portion of the central tendon, which is attached to the pericardium. The abdominal portion is covered for the most part by peritoneum.

A review of the literature on the subject of diaphragmatic hernia reveals about twelve hundred

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cases, about one third of which were reported since he beginning of the World War. Most of these atter cases, however, were not true hernia, but, as vill be explained later, prolapsus of the abdominal viscera through an injury to the diaphragm.

For simplicity, diaphragmatic hernia may be livided into two classes, true and false, and also nto congenital and acquired. The false herniæ are always produced by trauma, with resulting injury to he diaphragm, and prolapse of the intestine. These herniæ are not at first covered by a sac, but later on the prolapsed viscera become covered by a pseudomembrane and resemble true hernia. The diagnosis between the two conditions is very difficult in long-standing cases. The history of trauma will aid in its differentiation.

True diaphragmatic hernia is covered by a peritoneal sac. In the older cases, due to the growth of the hernia, the overlying pleura is pushed forward and therefore the hernia is covered by two serous sacs, peritoneal and pleural. There is a third variety, which, however, cannot be classed with the hernia, but which is often confused with hernia. It is mentioned for the sake of completeness, and also as an aid in the differential diagnosis. This third variety is known as eventration. It is a congenitally high position of the diaphragm, and unless one is careful, he might be misled into calling it a diaphragmatic hernia. This will be taken up later under the heading of differential diagnosis.

The etiology and pathogenesis of diaphragmatic hernia in traumatic cases is obvious and readily understood. A rent occurs in the diaphragm and through this defect the abdominal viscera are gradually sucked into the thoracic cavity by reason of the negative pressure of the pleural sac. At first in these cases the herniæ are rarely covered by a sac, but later, due to irritation, a pseudosac is formed. Anatomically, the condition can hardly be differentiated from true diaphragmatic hernia. If the rent is a comparatively small one, incarceration of the prolapsed viscera may occur, with perhaps resulting gangrene and perforation. This is an exceedingly dangerous complication even if operation be performed at once, on account of the probability of both peritonitis and empyema resulting.

True acquired diaphragmatic herniæ occur at the sites of perforation of the diaphragm. These sites have been enumerated under the anatomical discussion. The condition manifestly is very rare on the right side, owing to the protection afforded by the right lobe of the liver.

Hume has attempted to define the types of congenital diaphragmatic hernia and to indicate their probable pathogenesis. He describes four types: 1, through the hiatus pleuroperitonealis; 2, through the dome; 3, through the esophageal orifice, and 4, hernia due to the absence of the left half of the diaphragm. Type one is the most common, if fetal cases are considered. Hume suggests that the intestine follows the lung through the hiatus when the former leaves the celoma. The frequency is greater on the left side. Type two occurs as a true or a false hernia. Pressure of the abdominal viscera may produce a hernia at some weak point in the dome. Type three is due to the failure of the normal caudal migration of the stomach. If the embryology of the parts as described by Hume are accepted, hernia through the esophageal orifice cannot be regarded as acquired. Type four is not infrequently found in the fetus and is incompatible with life.

The diagnosis of diaphragmatic hernia may be made clinically or with the aid of the roentgenologist. A clinical diagnosis alone, proved by operation or postmortem, has seldom been made. The use of the x ray has been a wonderful aid in the diagnosis of this condition. However, in routine roentgen chest examination, diaphragmatic hernia has often been overlooked or wrongly diagnosed. The best diagnostic results have been obtained in those cases in which it was suspected clinically and then proved roentgenologically. It is important to make a diagnosis of diaphragmatic hernia, because if unreduced it may become strangulated and lead to the death of the patient. Diaphragmatic hernia must be differentiated from elevation of the diaphragm caused by a very large stomach, dilatation of the colon, ascites, pregnancy, and true eventration. Symptoms caused by diaphragmatic hernia vary considerably. Gastric symptoms are quite common and often the condition is wrongly diagnosed as gastric ulcer or carcinoma.

The records of the New York Post-Graduate Hospital reveal but one case of diaphragmatic hernia which came to operation. This case was wrongly diagnosed as a perforating ulcer with possible malignant degeneration. The roentgen examination of this patient had revealed a markedly deformed stomach with cardia and pylorus at the same level and an undue elevation of the left diaphragm. In spite of these roentgen findings and on the basis of the clinical history, which was almost classical of penetrating gastric ulcer, a preoperative diagnosis of ulcer was made.

The heart and cardia are often displaced to the opposite side and there may be an area of tympany in the thorax. Respiratory embarrassment is often manifest. It is in these cases, in which the clinician strongly suspects the presence of a hernia, that the roentgenologist is able to demonstrate it. Without the cooperation of the clinician, the condition is often overlooked by the roetgenologist. The presence only of solid viscera in the hernia would naturally render it more difficult for the roentgenologist to arrive at the correct diagnosis.

Congenital hernia due to a large diaphragmatic defect and prolapse of part of abdominal viscera, often leads to the death of the infant soon after birth. If operation is undertaken the prognosis is bad since the patient presents a grave operative risk.

The other varieties are amenable to operative treatment, if undertaken before incarceration or strangulation has occurred. If this latter complication has taken place, the case presents an extremely grave outlook with or without operation, on account of the danger of peritonitis or empyema. The best method of approach is the combined transpleural and transperitoneal route, after preliminary temporary blockage of the phrenic nerve. Opening the pleural cavity overcomes the negative pressure and allows of easier reduction of the herniated viscera.

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The author's references will appear in his reprints.

Chronic Irritable Colon*

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Chronic irritable colon is a functional disorder of the large intestine characterized either by refractory constipation of the spastic type, continuous mushy or watery stools, or alternating constipation and diarrhea, together with local and general symptoms of a rather varied nature. It includes many cases usually diagnosed as spastic constipation, as chronic colitis, as nervous diarrhea, and as intestinal and gastric neuroses. The term chronic irritable colon was suggested by Brown (1) because it seemed to him irrational to call this condition a colitis when no inflammatory changes are present.

INCIDENCE

Previously I (2) have called attention to the frequence of this condition in neuropsychiatric cases. Because of the confusion in nomenclature and because of the frequency with which it is overlooked, statistics are not available which throw much light on its incidence in medical practice. In my experience, however, chronic irritable colon has been met with three times as often as gastric carcinoma and five times as often as peptic ulcer. It is unquestionably the commonest gastrointestinal condition I am called upon to treat.

PATHOLOGY

Since this syndrome has been defined as a functional disorder, it is apparent that in an uncomplicated case, no colonic pathology is found. In the severe cases there may be, however, mild inflammatory changes in the mucosa. The colon is often spastically contracted either in certain parts or as a whole.

ETIOLOGY

The most important etiological factor is the increased irritability of Auerbach's plexus. This irritability of the intrinsic nervous mechanism of the colon is probably inherited in most cases, though a normal or even a sluggish plexus may be made irritable if insulted for a sufficiently long time. Many people probably have somewhat irritable Auerbach's plexuses, but have no serious symptoms therefrom, as they have learned by experience their dietetic, medical and hygienic limitations. When other etiological factors come into play, the irritability is markedly increased and the symptoms described hereafter appear.

The most important contributing factors are the enema and cathartic habits, chronic colonic obstruction, improper dietary habits, debilitating diseases, chronic appendicitis, chronic cholecystitis and ureteral pathology.

The enema and cathartic habits are mentioned first because they are perhaps the most important. They are further discussed under treatment.

Chronic colonic obstruction due to ptosis, kinks, stricture or new growths of the large bowel, peritoneal adhesions, pelvic tumors, pregnancy, anal spasm or stricture, may, by preventing the normal emptying of the bowel, help to bring about the syndrome of chronic irritable colon. The damming back of the bowel contents leads to putrefaction and liquefaction of the fecal mass, with the production of an irritating, malodorous stool. Moreover, such obstruction often leads to the enema or the cathartic habit.

Improper dietary habits, especially the ingestion of large amounts of fried foods, rich pastry, and too coarse or poorly cooked foods, are important etiological factors. Thorough mastication is so important that this syndrome often develops in individuals who have lost most of their teeth.

Sufferers from the debilitating diseases, such as tuberculosis, nephritis, carcinoma, and diabetes, not infrequently have symptoms of chronic irritable colon which clear up when the underlying disease is under control. This is especially true of pulmonary tuberculosis.

Chronic appendicitis, chronic cholecystitis, and to a lesser extent other foci of infection, such as apical abscesses and sinus or tonsillar infections, are recognized etiologic factors. The evidence is strongest against the appendix. Deaver (3) has pointed out that long standing chronic appendicitis may even cause a true inflammatory colitis.

Another factor of lesser importance is discussed by Goldschmidt and Mulleder (4). They report a series of cases apparently of this syndrome following extensive operations on the stomach. The probable explanation is that these plastic operations caused too rapid emptying of the stomach and upset the nicely timed mechanism of gastric and intestinal digestion. The bowel disturbances in achylia gastrica, as pointed out by Stockton (5), are probably of the same origin, as the undigested food is propelled rapidly to the colon, where it is attacked by the fermentative and putrefactive bacteria with the formation of an irritating stool.

Biliary obstruction, pancreatic deficiency, or chronic enteritis with deficiency of the intestinal enzymes may also result in incomplete digestion in the small bowel. In some cases the carbohydrates alone are undigested and a fermentative diarrhea results. In some others, the proteins are not digested and a putrefactive diarrhea results.

Another somewhat less recognized cause of the syndrome of chronic irritable colon has been emphasized by Hunner (6), namely, ureteral stricture and its associated pathology. I have had several cases illustrating this factor in my series.

In persons having irritable Auerbach's plexuses many minor factors will precipitate an attack of diarrhea. These include dietary indiscretions, menstruation, grief, fright, anxiety, mental stress and overfatigue. Chilling of the body surfaces and minor systemic infections, such as colds and bronchitis, are also important factors. In fact, in a severe case any lowering of the bodily resistance may precipitate an attack.

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COURSE

The course is an extremely chronic one, often with long remissions or at least comparative freedom from symptoms; in fact, it probably accompanies many individuals from the cradle to the grave. It is likely that the extreme difference between infants in their reaction to the same dietetic regimen may be explained, in part at least, by inherent differences in the excitability of the nervous mechanisms of their gastrointestinal tracts. It is met with not infrequently in young children who have been improperly fed. Diarrheic attacks are often confined to periods of lowered physical resistance, or following feast days. In adult life these individuals may do well when living at home where their selfdiscovered dietary limitations are known and adhered to, but if circumstances make dieting impossible, their sufferings begin. The degree of invalidism resulting depends largely on the type of personality of the sufferer, and on his experiences with the medical fraternity. If his symptoms have been called "imaginary" or "due to nervousness," he is likely to become neurotic, while if they are understood and properly treated he will be more apt to face his difficulties stoically.

SYMPTOMATOLOGY

For purposes of description, the symptoms of chronic irritable colon may be divided into three classes: firstly, those referable to the colon itself; secondly, those resulting from reflex effects on other organs; and thirdly, those due to absorption of toxic substances.

Of the first class, perhaps the most frequent symptom is diffuse abdominal discomfort, present practically continuously but much aggravated by a diarrheic attack. It may be severe enough to be described as abdominal pain by the patient, and it is often most marked over the splenic flexure or the cecum. The discomfort is worse just before and just after defecation. It is relieved somewhat by the passage of flatus, of which there is usually an abnormally large amount. Another symptom frequently complained of is intestinal cramps. These are often more severe just before a bowel movement, but not necessarily so. The act of defecation may be followed by mild tenesmus, and a feeling of incomplete evacuation. Actual filling of the colon with gas may lead to marked distention with pressure symptoms such as palpitation, angina, or dyspnea.

The chief reflex symptoms are gastric and include heartburn, attempts at belching, and an uncomfortable feeling of fullness after even a small meal. Many state that they feel hungry before they start to eat, but after taking a few mouthfuls, they feel so full that they can eat no more. Some patients have nausea and more rarely vomiting during the diarrheic attack. So important are the gastric symptoms that many patients come to the physician with a selfmade diagnosis of dyspepsia or chronic gastritis.

In attributing the symptoms about to be described to toxic absorption from the bowel, I realize that I am running the risk of being dubbed oldfashioned. No one can condemn more strongly than I the too frequent diagnosis of intestinal autointoxication, especially when it is made without a thorough search for other causes of the symptoms. That toxic absorption does not occur from the normal bowel, or from the atonically constipated bowel, is now conceded by most internists. The experiments of Donaldson (7) on voluntary constipation in healthy men seem to indicate that many of the symptoms of constipation are reflex. If, however, sufficient damming back occurs to permit regurgitation of fecal matter into the ileum, or to promote excessive putrefaction in the upper colon, absorption of toxic materials seems at least theoretically possible. Certainly, when there is either a continuous foul diarrhea, or alternating constipation and diarrhea, toxic absorption is possible. The diarrheic stool in these conditions is so irritating that defecation is often accompanied by burning and scalding about the anus. Such a stool might conceivably cause sufficient temporary damage to the epithelial cells of the mucosa to cause them to permit the absorption of toxic products in much the same way that intestinal obstruction in the small bowel permits the absorption of histamine, as has been demonstrated by Dragstedt (8). Donaldson himself says, "I have no disposition to deny that cases of autointoxication of intestinal origin do exist," and states that Alvarez and Bainbridge (9) believe that it is present in cases of persistent diarrhea. Von Noorden (10) is of the same opinion. The work of Luckhardt (11) and his coworkers on the etiology of tetany supports strongly the theory of toxic absorption from the intestine.

The chief symptoms which may be attributed to toxic absorption are headache, general malaise, neuralgia, arthralgia, myalgia, precordial pain, urticaria, acne and other skin conditions, retinitis, tachycardia, fatigability, loss of energy, insomnia, and other neurotic and neurasthenic manifestations. Elsewhere I (2) have described somewhat at length the psychoneurotic manifestations of sufferers from this disorder and explained the pathogenesis of their neurosis. In the same place are several case reports illustrating the symptomatology and complications.

PHYSICAL FINDINGS

The skin often has a subicteric, "muddy" appearance not unlike that seen in malignancy. The tongue is usually heavily coated, and the breath is often foul. In the more severe cases, there is marked tenderness over the entire abdomen, but in the ordinary case only the colon and the abdominal plexuses are tender. Sometimes only a part of the colon is tender. Frequently it is found to be spastically contracted. Proctoscopic examination is usually essentially negative. Tenderness over the nerve trunks is a frequent finding.

LABORATORY FINDINGS

Laboratory examinations reveal, as a rule, a normal blood picture or only a moderate anemia. Gastric analysis usually is normal, although, as pointed out by White in an excellent article (12), there may be either hyperacidity or hypoacidity. Fluoroscopic and radiographic studies may show no gastrointestinal pathology whatever. They often show delay in the emptying of the colon. The colonic shadow may show a narrowing due to spasticity, and the associated pathology is often demonstrated by radiography.

The stools (13) usually show characteristic changes. A word of caution is necessary, however,

as the stool at times, even in a severe case, may be nearly if not quite normal. Repeated examinations are necessary and a careful history is more important than fecal analysis. The character of the stool varies widely in different cases and in the same case at different times. It may consist of very hard, small masses, or it may have a watery consistency and contain much mucus. Between these two extremes all possible gradations are found, except that a large, formed stool is a rarity. The most frequent is the "mushy" stool containing some mucus, which, however, is only mushy in the jar. When passed into an ordinary closet bowl, the " mushy" stool often forms long thin ribbons, or shorter pieces exploded by gas. Few physicians know the gross appearance of a normal stool. Ignorance in this matter is apt to lead to many errors in diagnosis. Microscopic examination reveals no pus or blood, unless there are complicating conditions. Undigested food may be present if the stool is loose. Staining by Gram's method is important, for in the fermentative type, gram negative organisms predominate, while in the putrefactive type gram positive organisms are more numerous. The reaction to litmus is acid in the fermentative type, and alkaline in the putrefactive type.

DIAGNOSIS

The diagnosis of chronic irritable colon is not difficult as a rule, but a thorough physical examination with especial attention to the gastrointestinal tract should be made in each case, as this syndrome may accompany and mask serious organic disease such as appendicitis, cholecystitis, carcinoma of the stomach or bowel, ulcerative colitis, intestinal obstruction, pernicious anemia, ureteral stricture, pulmonary tuberculosis, etc.

A complete discussion of the differential diagnosis is obviously beyond the limits of this paper. Two functional disorders of the colon will be mentioned, however, to assist in differentiating this syndrome from closely allied conditions, namely, atonic constipation and mucous colitis.

Atonic constipation is not accompanied by marked abdominal discomfort, or signs of toxemia. The stools are large and formed, and diarrhea never occurs. Radiographic study shows dilatation rather than narrowing of the bowel.

Mucous colitis is characterized by the periodical expulsion of large amounts of thick, tenacious mucus. In its typical form, it is an uncommon condition of obscure etiology. Its treatment, however, does not differ materially from that indicated in chronic irritable colon, so that exact differentiation is not required.

TREATMENT

The first step in the treatment should obviously be directed against the organic etiological factors. If systemic disease exists, it should be vigorously treated. Surgery is often necessary, but it does not cure—it only makes a cure possible. Appendectomy, cholecystectomy, or radical cure of colonic obstruction, must be followed by medical treatment. The neglect of adequate postoperative medical treatment is responsible for many clinical failures following operations that are distinctly indicated in themselves.

The next step in the treatment is to eliminate each of the other important etiological factors. The abuse of cathartics probably leads to more invalidism than the abuse of morphine. Certainly there are many more cathartic addicts than morphine addicts, and it sometimes seems that it is as hard to break the former of the habit as it is the latter. B. W. Sippy often made the statement that he had not used a cathartic in the treatment of constipation for twenty years, and it is certain that there would be far less intestinal invalidism if every physician would follow his example. The routine use of laxatives before and after operations has been wisely attacked by Alvarez and others. Fantus (14) in his little book entitled *Useful Cathartics,* which should be on every practitioner's desk, teaches a very sane policy. After condemning the indiscriminate use of cathartics by the laity, he says, "let us be sure our hands are clean. A cathartic prescribed by the physician is no less liable to produce a cathartic habit than one taken by the patient on his own account. Indeed, when the physician prescribes the remedy, the patient feels all the more certain that it is good for him, and he is likely to keep taking it. After all, the medical practice of the laity reflects the past practice of the medical profession."

Of almost equal importance is the correction of dietary errors. A complete discussion of the effect of various foods on the gastrointestinal tract in health and disease would require many pages. I can only outline briefly some of the more common dietary factors of importance in the syndrome of chronic irritable colon. Fat is perhaps the chief offender, especially when used in frying or as shortening. Butter and vegetable oils are somewhat less harmful. Roast pork, sausage and pork chops seem especially pernicious. In frying or when used as shortening, the fat forms a coating around the food particles, which makes digestion in the stomach impossible, and in the small intestine difficult and incomplete. When this material reaches the colon, it is attacked by bacteria and the fats are split up into the irritating fatty acids. Neutralization and saponification of these fatty acids, which normally take place in the small intestine, are impossible in the colon. The destruction of the fatty coating liberates the carbohydrates and protein which in turn are attacked by fermentative and putrefactive bacteria with the formation of carbon dioxide, hydrogen sulphide and other gases, indol, skatol, histamine, etc. These irritating and toxic substances may act as drastic cathartics, and cause purgation. If immediate evacuation does not result, absorption is likely to follow with resultant symptoms of socalled autointoxication.

Inadequate cooking is another important factor. The walls of all vegetable cells are made up of cellulose which is burst by thorough cooking and the contents are exposed to the action of the digestive juices. Inadequate cooking leaves a number of the cells unaffected and since cellulose is not normally digested by the gastric or intestinal enzymes these cells reach the colon intact. The cellulose is there attacked by the fermentative bacteria, and the cell contents are exposed to bacterial action. Raw food is often less irritating than partially cooked food probably because it passes through the entire gastrointestinal tract without digestion or destruction by bacterial action. The cell structure differs greatly in different vegetable foods, which perhaps accounts

for the great variability in the length of cooking necessary.

Not only the quantity and distribution of cellulose, but the chemical properties of the cytoplasm are of great importance. Let us compare, for example, cabbage and spinach. Cabbage requires prolonged cooking, and its ingestion even in small amounts is always followed by untoward symptoms in a sufferer with chronic irritable colon. Spinach, on the other hand, requires comparatively little cooking, and is very well borne when taken in the same quantity. Squash is well borne, while navy beans cause a marked disturbance.

The effect of fruit on the bowel depends chiefly on its chemical constituents. In the process of ripening, most of the starch and cellulose is converted into sugar, so that cooking is needed chiefly to soften the fruit and to assist in its thorough mastication. Mastication of raw fruits is seldom complete, so that the skin and large masses of the pulp reach the colon undigested. There they are attacked by bacteria and irritating substances may result. It is well known that fruit juices vary considerably in their laxative effect. Apple juice, grape juice, watermelon juice, etc., are laxative, while blackberry juice is distinctly constipating. The effect of a given fruit, therefore, depends on several factors: firstly, whether the skin and seeds are swallowed; secondly, whether the pulp is finely divided; and thirdly, whether the juice has a laxative or costive action.

The exact management of a sufferer with chronic irritable colon depends upon whether he is having continuous diarrheic or mushy stools, alternating constipation and diarrhea, or continuous constipation. It is important to recognize that these are different stages of one process, for a sufferer may pass through all of these forms in a year. In certain cases, however, one type seems to predominate for a long time. Not infrequently following treatment for the diarrheic type, the spastically constipated type developed. In these instances the patient seems to lack the necessary courage to increase his diet adequately, fearing the return of the diarrhea. In still other cases the stools will be normal for long periods, with brief attacks of diarrhea caused by the associated pathology or lowered physical resistance or dietary indiscretions.

TREATMENT OF DIARRHEIC FORM

When continuous diarrhea is present, the patient should be put to bed and dry heat applied to the abdomen. The diet should consist of foods leaving no residue, and as bland as possible. Thin gruels of farina, rice or barley, crackers, and fat free broth may be given at frequent intervals. This diet should be continued until the diarrhea is checked, and only one or two stools are passed a day. Even if the stool is still mushy, the addition of certain soft foods is indicated. The first to be added are the simple puddings, such as those made with farina, cornstarch, tapioca and rice. Custards, soft boiled or coddled eggs and crisp toast may be added cautiously. Still later lean, well cooked roast beef or mutton, or stewed chicken may be added followed by the purees of potato, celery, tomato and spinach. Some authors describe fermentative diarrhea and putrefactive diarrhea and recommend treating the former with a carbohydrate free diet and the latter with a protein free diet. This is very useful in certain cases but usually complete elimination of neither carbohydrate or protein is necessary. The symptoms and character of the stool must be the guide in increasing the diet and in allowing the patient more liberty.

Medicinal aid is usually not necessary or advisable. In obstinate cases I use Sippy's powder consisting of equal parts of calcium phosphate, calcium carbonate and bismuth subnitrate, in one or two teaspoonful doses every four hours. Von Noorden (10) recommends atropine in from .001 to .003 gram daily, but others have found it uncertain in action. It is perhaps of greatest assistance in the spastic type, when cramping is very troublesome. The use of opium or of tannic acid preparations by mouth is usually harmful and should be avoided. The use of sedative drugs, such as the bromides, the hypnotics and codeine, may be of assistance for a short time in neurotic cases. It must be recognized that drug therapy is palliative, while dietary management is curative.

TREATMENT OF PATIENT WITH MUSHY STOOLS

The treatment of the patient with mushy stools includes hygienic and dietetic measures. The use of drugs is entirely unnecessary as a rule, and their prescription is apt to detract unduly from the importance of dietary measures. The patient should lead a quiet, well ordered life, avoiding overfatigue, excitement and exposure. Plenty of sleep is an essential and a short rest after meals is very helpful. Complete cessation from work is not necessary as a rule. The fact that the patient has not diarrhea indicates that he is partially able to cope with the situation without dietetic help. If, however, he fails to improve under treatment while at work complete rest should be ordered. A careful inquiry into the patient's dietary habits should be made, and the offending articles of diet eliminated. Frequently this is all that is necessary. In other cases, giving the patient a diet sheet and explaining carefully the rationale of the treatment and briefly outlining the reasons for eliminating certain articles of food from his diet will be sufficient. The accompanying diet sheet (Table I) with individual modifications, is used in this clinic.

The patients with alternating constipation and diarrhea usually respond to the same treatment as those with mushy stools, though a somewhat more laxative diet may be necessary. The diet should not be too strict during the temporary diarrheic attacks, lest constipation again return. It is necessary to secure a bowel movement every day in these cases. This can be brought about by dietetic management alone if supervision is close enough. The patient may be instructed to take one half to two ounces of mineral oil at night if the bowels have not moved that day, or if the movement has been very dry and hard. The next morning if the bowels do not move a rectal injection of one half to one pint of normal saline may start the movement. Petrolagar, in one to two tablespoonful doses, once or twice a day is often helpful.

SPASTIC CONSTIPATION

In continuous spastic constipation, the diet should be moderately bland, but must contain a large

TABLE I.

Fluids:	Large amounts of water; milk and cream; weak cocoa, tea or coffee.
Soups:	Cream of tomato; puree of potato, pea, corn, celery or asparagus; meat soups if not greasy.
Bread:	Crackers, white bread and toast. No bran or graham bread.
Cereals:	Farina, rice, oatmeal and corn flakes.
Eggs:	Two or three daily in any style except hard boiled or fried.
Meat:	Chicken, turkey, baked fish, lean beef or lamb very well cooked and carefully masticated.
Vegetables:	Potatoes, sweet potatoes, spinach, young beet greens, squash, lettuce, tender asparagus, stewed or raw celery, tomatoes cooked or raw, very tender string or wax beans, carrots, turnips. All vegetables must be well done.
Fruits:	Stewed prunes, baked apples, apple sauce, stewed peaches, stewed pears, stewed apricots, stewed figs, stewed plums, fresh oranges, grapefruit, strawberries, raspberries, blackberries and musk melon. Eat small quantities of all the above except prunes and oranges, which can be had liberally.
Desserts:	Rice pudding, tapioca pudding, farina pudding, bread pudding, cornstarch pudding, custards, jello, simple cookies and light cakes, (sponge cake, etc.). Ice cream and sherbets may be tried cautiously. Honey and jelly in small quantities.
Misc:	Macaroni, spaghetti, cheese, butter, peanut butter.

AVOID THE FOLLOWING

All fried foods and all food containing shortening; all highly seasoned foods; candies; nuts (including peanuts), watermelons, grapes, bananas, beans, peas, cabbage, beets, onions and pork.

CONSTIPATION

The fruits and vegetables and other laxative foods should be taken in just sufficient quantities to produce one or two normal bowel movements a day.

Never take cathartics or large enemas.

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residue. Too coarse food should be avoided. The indiscriminate prescribing of "bran, coarse vegetables and plenty of fruit" for every constipated person leads to much intestinal dysfunction. The use of coarse foods may be useful in the treatment of atonic constipation, and of constipation in some cathartic addicts, but is certainly pernicious in most cases of spastic constipation. The foods mentioned in the diet list given above are well adapted for cases of spastic constipation. The laxative foods in this list should be taken in very liberal quantities. Spinach and prunes are especially valuable as they are bland and nonirritating even in large quantities, but efficient in overcoming this type of constipation. Defecation at exactly the same time each day is very essential. The patient should be taught to set apart a certain half hour during the day, for defecation. Reading while at stool is helpful as it often leads to relaxation. If at the end of the half hour the attempt is unsuccessful, the injection of one half pint (250 c. c.) of normal saline solution will often suffice to start the movement. Drinking one or two glasses of hot water on arising is often beneficial. The patient should also be instructed to drink plenty of water during the day.

The use of other than dietary and hygienic measures is not necessary in spastic constipation provided the patient is under close observation and cooperates completely. The measures suggested for a relief of constipation in the cases with alternating constipation and diarrhea may be used here if necessary. Petrolagar is especially valuable in some cases of spastic constipation. The use of retention oil enemata is also valuable. No medicated enemas or other laxatives should be used, and the patient should be taught that constipation is less harmful than catharsis.

In general, it will be seen that the treatment of chronic irritable colon requires prolonged dietary management, and much patience on the part of both the physician and the sufferer. The patient must ultimately learn his dietetic limitations, and must become sufficiently conversant with the principles outlined in this paper to keep his bowels normal and to be able to treat himself when suffering from temporary diarrhea, or constipation.

SUMMARY

1. Chronic irritable colon is a very common functional disorder of the large intestine. It includes many cases previously diagnosed as chronic colitis, spastic constipation, nervous diarrhea and intestinal and gastric neuroses.

2. The most important etiological factors are an inherent irritability of Auerbach's plexus, the enema and cathartic habits, chronic colonic obstructions, improper dietary habits, debilitating diseases, chronic appendicitis, chronic cholecystitis and ureteral pathology.

3. Discovery and treatment of the etiological factors in the individual case is of paramount importance in therapy, but must be followed by dietary management.

4. Therapeutic failure indicates either that important underlying etiological factors have been overlooked, or that the patient has been unable or unwilling to cooperate sufficiently in the treatment.

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The Treatment of Hourglass Stomach

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This condition is characterized, as the term itself implies, by a mesogastric constriction which imparts to the stomach the shape of an hourglass. The organ is divided into two pouches, an upper or cardiac and a lower or pyloric, and these two pouches are connected by a canal or zone of constriction.

The hourglass condition may be due to one of the three following causes:

1. Spasm of the stomach muscle about an ulcer. An acute angled depression in the greater curvature is formed at a point exactly opposite the location of the ulcer on the lesser curvature.

2. Induration of the gastric parietes by a progressive fibrous ulcer. The ulcer is sometimes associated with a perigastritis and becomes surrounded with adhesions. The stomach walls, still soft and able to contract, immobilize the diseased portion of the organ.

3. Complete cicatrization of a healed ulcer. The segment of stomach intervening between the two pouches consists of a fibrous canal. The ulcer itself has gone on to recovery.

I have operated in forty-three cases of noncancerous mesogastric stenosis. In only eight instances was a narrowing due to healed ulcer, forming a fibrous ring between two stomach pouches, noted in the course of the operation. The other thirty-five cases revealed an ulcer still in process of running its course, and in about one half of these cases the ulcer was of the boring type, having destroyed the stomach wall and penetrated into neighboring structures—pancreas and abdominal wall.

The indication for operation necessarily varies in different cases. Personally, I always made use of the same procedure, viz., partial gastrectomy; the majority of surgeons, however, regard the indications as varying according to whether the ulcer present is active or healed.

FINDINGS UPON LAPAROTOMY

Ordinary cases.—A mesogastric constriction. This constriction is sometimes situated high up, the upper pouch being, accordingly, small; in other instances it is situated low down, in which event the lower pouch is of reduced size and the upper one very large.

The constriction exhibits the shape of a broken ring. It is excentric in location near the lesser curvature. On the peritoneal aspect there is noted a fibrous, white scar, hidden by perigastric adhesions.

In one half the cases there was found in the zone of constriction a boring ulcer penetrating into the pancreas, the liver, the abdominal wall, or sometimes in two or all of these directions simultaneously. The stomach as encountered in the operation does not always show the hourglass shape previously seen with the x ray. The true hourglass stomach is one the narrowed portion of which consists of a cicatricial canal at the site of a healed ulcer. As a matter of fact, the majority of bilocular fluoroscopic pictures relate to ulcers still in the progressive stage. Notably in the boring type of ulcer, a macula corresponding to the ulcer diverticulum is seen in the picture. This macula is located between the two dark areas representing the two pouches.

Other varieties.—Mesogastric stenosis present in conjunction with a duodenal stenosis; cancerous degeneration of a stenosing ulcer; gastrocolic fistula at the site of the narrowed, ulcerated segment; perigastric abscess about a stenosing ulcer.

TREATMENT

The treatment is always surgical.

Type I.—Hyperchlorhydria is absent; healing of the ulcer is complete; no trace of an ulceration remains, and the stomach walls are soft. In such a case the operator may rest satisfied with the performance of a gastrogastrostomy, a gastroplasty or an annular gastrectomy, followed by end to end gastrogastric suture.

Type II.—The ulcer is still in a state of activity, and the stomach walls are hard and thickened. The procedure required here is partial gastrectomy, i. e., removal of the pylorus, the antrum and the constricted portion, followed by gastroenterostomy (gastroduodenostomy or gastrojejunostomy).

This latter operation is indicated in most instances because of the fact that the ulcer is usually still progressive and that the only lastingly effective treatment of gastric ulcer is a wide gastrectomy.

The technic of the operation is as follows:

1. *Anesthesia.*—Regional, by infiltration of the parietes and block of the splanchnic nerves with one per cent. syncaine (procaine).

2. *Abdominal incision.*

3. *Abdominal exploration.*—The operator should ascertain whether the stomach is freely movable, the location of the constricted portion, whether an active ulcer is or is not present, and whether there are adhesions to be freed.

The operative technic necessarily varies in different cases. Following is the mode of procedure in a case of mesogastric stenosis of the intermediate type:

4. *Stripping of the greater curvature.*—The operator, laying hold of the pyloric antrum with his left hand, takes a gauze sponge with his right hand and rubs it over the insertion of the omentum in order to detach the latter from the greater curvature and pyloric pocket down to the duodenum. If the duodenum is broad, the upper pouch long, and the operator thinks he will be able to carry out a gastroduodenal anastomosis, he dispenses with the stripping of the lower border of the duodenum, which he preserves intact, since this structure is later to be united to the cardiac pouch. In the contrary event the stripping is continued over a portion of the duodenum, which is presently to be divided and closed as a blind end.

5. *Division of the duodenum.*—Two pairs of crushing forceps are applied on the duodenum immediately below the pylorus, and the gut divided with the knife between the two pairs of forceps.

6. *Division of the pyloric artery and gastrohepatic omentum.*—This is carried out with the knife in immediate contact with the lesser curvature.

7. *Liberation of the constricted segment.*—The stripping of the greater and lesser curvatures has first been carried out gradually to the point of constriction, whether the latter be associated with a progressive ulcer or a cicatricial stenosis.

The operator next proceeds to liberate the posterior surface of the stomach. Frequently the latter is the seat of a perforation and forms part of a boring ulcer which is penetrating into the pancreas or the liver. The knife is then passed in the thickness of the stomach wall immediately against the pancreas. It enters the gastric cavity. As there is risk of extravasation of the stomach contents, the operator passes an aspirator into the gastric cavity (cardiac aspect) and empties the latter. A pad is placed in the stomach. The liberation having been completed posteriorly, if the case is one of boring ulcer, the operator removes a bit of tissue from the margin of the pancreatic ulcer for a biopsy, in order to determine the ultimate prognosis of the excision. The ulcer may, indeed, be undergoing cancerous change.

8. *Division of the stomach.*—Previous to the division of the stomach it is generally of advantage to begin the anastomosis, introducing the posterior seroserous plane of sutures and joining the stomach either to the jejunum or the duodenum. This gastrointestinal suture has for its purpose to prevent retraction of the upper segment of the stomach. The duodenum having been brought in contact with the upper pouch and attached to it with a continuous seroserous suture, the operator resects the anterior wall of the gastric pouch above the constricted portion of the organ and the anastomosis is then continued in the three planes of suture.

9. *Gastrojejunal anastomosis.*—In case the gastric stump is too small, the stump of the duodenum should be closed with a double row of sutures or a purse string and the operation concluded with an implantation (Pólya) of the gastric stump in the jejunum. Where, on the other hand, a sufficiency of stomach and duodenal tissue is available, the operator should institute an end to end gastroduodenostomy (Péan or Billroth I operation).

In the event of a gastrojejunal anastomosis, if the jejunal loop is short, it is unnecessary to conclude the operation with a secondary button jejunojejunostomy; but if, on account of retraction of the stomach and the small size of the cardiac pouch, the operator carries out a long loop gastrojejunal anastomosis, a jejunojejunostomy with the Jaboulay button should be added.

Generally the anastomosis carried out is precolic. If, however, the mesocolon has been torn through during the operation, the loop should be passed through the opening in the mesocolon, constituting a retrocolic procedure.

If the operator is able to bring the opening in the mesocolon up to the gastric stump, he closes it by suturing it to the stomach. If, on the other hand, such a maneuver would require traction on the gastrojejunal suture line, he omits this step in the operation.

In my forty-three resections of the stomach for hourglass contraction there were three deaths and forty recoveries, or a mortality of about seven per cent. Many cases call for difficult operative procedures. The mortality is, however, increasingly tending downward. The mortality in my cases of resection of the stomach for ulcer now ranges from about two to three per cent.

Study of the late results of this operation warrants the assertion that, of all the operations employed, partial gastrectomy with gastrojejunal or gastroduodenal implantation is the procedure giving by far the best results. *I have not observed a single therapeutic failure.* There is no form of postoperative disturbance among the after results.

It may be stated as an axiom that the more widely the operator removes the stomach walls for gastric ulcer, the better are the remote operative results.

Diverticula of the Stomach*

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Diverticula of the stomach is by no means a common occurrence; if present, it may easily be overlooked by the novice or even by others more experienced unless they are thoroughly conversant with the normal variations of the human stomach as viewed under the fluoroscope or upon the film. The excavation into adjacent tissue sometimes produced by perforating gastric ulcer is not really a diverticulum, though often thus called. Pathologists customarily divide diverticula into the true and false. In the former the diverticular sac contains all the coats of the viscus mucosa, muscle and serosa; in the false type one or more layers are missing, most often the muscular, in which case the condition has been described as hernia mucosa.

I will report two cases of diverticula, both having been operated upon and the diagnosis confirmed. These patients have been under the care of competent physicians and have been dieting and taking drugs without benefit.

Case I.—H. J., aged forty-nine, married, a furrier, weight one hundred and thirty-four and a half pounds. His family history was negative. His past history showed that for thirty-two years he had had

*Presented before the Clinical Society of the Jewish Memorial Hospital, January 6, 1925.

Fig. 1.—Prone position Fig. 2.—Modified oblique Fig. 3.—After six hours

a burning sensation coming on one or two hours after meals. At times he was relieved for days or weeks. His present complaint was loss of weight, with cramps in epigastrium radiating to abdomen and back (left). His appetite was poor, he was nauseated and belched a great deal; no actual vomiting. Bowels were constipated. Food gave temporary relief, but after several hours, depending upon the quantity and quality of food, the pain became more severe. No relief was obtained from alkalies or belladonna.

Physical examination.—Patient seemed to be suffering a great deal. His hand was on the epigastrium pressing towards the spine which eased the pain somewhat. Pulse, 72; temperature, 98.4; respirations, 28; blood pressure, systolic 110, diastolic 85. Heart and lungs were normal. There was tenderness in the epigastric region and left hypochondrium, and also marked tenderness to the left of the umbilicus. Change of position: patient lying on the right side seemed to have increased tenderness in the epigastric region and tenderness was also elicited in the right hypochondrium. The latter was not present in the prone position. Deep pressure in the epigastrium seemed to relieve the pain but was followed by excruciating pain afterwards. A tentative diagnosis of gastre ulcer was made.

Laboratory examination.—Urine and stool, negative. Test breakfast: Free hydrochloric acid, 25; total acid, 42; combined, 17. Microscopic findings were negative. Blood: hemoglobin, 65; white blood cells, 5600; polymorphonuclears, 55 per cent.; mononuclears, 3 per cent.; transitionals, 5 per cent.; lymphocytes, 37 per cent.

Röntgen examination.—Chest and heart, negative; eosphagus, negative. Stomach, observation under the fluoroscope while drinking a barium buttermilk mixture showed a moderate sized stomach, poor in tone, and absence of peristalsis. Further observation revealed a pouch two or three inches below the cardia with a smaller pouch protruding from the larger one. On palpation part of the barium was pressed back into the stomach and the patient complained of pain. On the lesser curvature near the pars media there was a large niche also tender to touch. Patient was given two medium boiled eggs, some bread and butter and a glass of water. Reexamination an hour later confirmed the diagnosis of ulcer on the lesser curvature and a large diverticulum. Six hour examination showed a partly emptied stomach with barium in the diverticulum and niche. Patient complained of severe cramps in the upper abdomen and radiating to the back. These pains came on about two and a half hours after the ingestion of barium buttermilk and eggs. The twenty-four hour examination showed a small gastric residue and the diverticulum was still filled with barium. No further examination was made. The patient was referred to the surgeon for operation.

Report of the surgeon.—The abdomen was opened and the stomach exposed and examined. About two and one half inches below the cardia and densely surrounded by adhesions, was a small mass the size of a hazel nut, with a tube attached to the lesser curvature of the stomach. After carefully dissecting it from the surrounding adhesions the stomach was incised and a probe passed into this tube and through it to the small sac attached to it. The entire thing was excised and the incision in the stomach closed. The patient's condition did not permit any further manipulation and the large ulcer near the pars media was permitted to remain.

The patient made an uneventful recovery and was discharged from the hospital after three weeks. At home the patient was put on the Sippy diet for ulcer and within three months no trace of the niche remained. The lesser curvature, with the exception of a slight indentation about two and a half inches below the cardia, was smooth and the emptying time of his stomach and peristalsis were normal.

The patient has been under observation from time to time, his diet is carefully supervised and his mode of life regulated. His present weight is 165 pounds.

Report of the pathologist.—Examination of the specimen removed from H. J. shows a narrow tortuous tube ending in a small pouch about the size of a hazel nut. On incision it was found full of barium and some stringy mucus with food particles adhering to it. Microscopic examination of frozen sections reveals the presence of all the coats of the stomach.

Case II.—H. L., aged forty-nine, business man, weight 124 pounds. Family history was negative. Past history was also negative except for stomach trouble for the past nine years.

Present complaint.—The patient complained of being attacked with abdominal distention and pressure in the epigastrium after eating certain foods. These attacks occurred seldom, but when they did they were quite severe. The patient did not vomit, there was no burning, the appetite was fair, bowels were irregular.

Physical examination.—Pulse and temperature normal. Heart and chest negative. Blood pressure 100-85. Marked tenderness and some rigidity to right of the median lie midway between the ninth cartilage and the umbilicus. Position did not change the location of the tenderness. Clinical diagnosis, cholecystitis and possibly cholelithiasis.

Laboratory findings.—Urine and stool negative. Test breakfast: Free hydrochloric acid, 46 per cent.; total acid, 61 per cent.; microscopic findings, negative. Blood: hemoglobin, 90 per cent.; white blood cells, 8400; polymorphonuclears, 65 per cent.; mononuclears, 3 per cent.; transitionals, 5 per cent.; lymphocytes, 27 per cent.

Röntgen examination.—Heart and chest, negative; esophagus, negative; stomach, moderate ptosis otherwise negative; duodenum, cerrated, adherent to gallbladder and on manipulation a marked projection was noticed which was quite tender to touch. Opposite to this a constant deformity or incisure was present. A diagnosis of duodenal ulcer with periduodenal adhesions was entertained, and in view of the findings and the chronicity of the case the patient decided to be operated upon.

Report of the operation.—After the usual preparation the abdomen was opened, the gallbladder was found surrounded by dense adhesions, also a small healed ulcer of the duodenum was found. Further examination of the duodenum revealed a small pouch which was excised and on examination proved to be a diverticulum of the duodenum. The pathologist reported a true diverticulum.

The patient made an uneventful recovery and is under observation at the present writing. Röntgen examination shows a normally functioning stomach and duodenum.

777 Madison Avenue.

How to Make a Snapshot Diagnosis of Hemorrhoids

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The term snapshot diagnosis arose some years ago from the seeming ability of a clever diagnostician to arrive at a formed diagnosis of whatever case presented itself to his notice with about the same rapidity that one may take a snapshot picture with a camera. Since that time, those of us who aim to be considered clever attempt to emulate the aforementioned worthy and make our diagnoses instantaneously. The following paragraphs are a sure guidance for the attainment of such skill.

A patient presents himself at your office and complains of pain upon defecation. Plainly the snapshot diagnosis is hemorrhoids! Careful proctoscopic examination, however, shows the presence of an anal fissure but an otherwise normal rectum and anus.

Another patient complains of a protrusion from the rectum upon defecation. What could be simpler than the snapshot diagnosis—hemorrhoids! Careful proctoscopic examination reveals the presence of a large prolapse of the rectum which protrudes to the extent of three inches from the anus following defecation and which may be manually replaced.

Yet another patient complains of bleeding from the rectum and soreness upon defecation with intermittent soreness at other times. Swift and sure comes the snapshot diagnosis—hemorrhoids! Careful proctoscopic examination, however, leads one to the conclusion that the cause of the patient's soreness and bleeding lies in a chronic ulcer of the rectum.

The next patient tells you he has piles—"itching piles." So nothing could be more certain than the snapshot diagnosis—hemorrhoids! Proctoscopic examination, however, to the contrary, shows the absence of hemorrhoids and the presence of condylomata about the anus.

Finally, there comes a patient in whom we have a history of persistent bleeding and some pain upon defecation. Nothing could be more definite than the diagnosis of hemorrhoids. Unfortunately, however, thorough proctoscopic examination discloses the presence of a large ulcerating mass infiltrating the rectal wall and a biopsy of this shows it to be an adenocarcinoma of the rectum.

I fear that in the instances mentioned above I have spoiled a good story by sticking in the facts, but facts are troublesome things to deal with if repressed, for, like murder, they will "out," sometimes to somebody's embarrassment. We would not expect a camera to take a picture without allowing it the privilege of at least one look, so we cannot logically expect to arrive at a conclusion as to the nature of rectal ailments without being accorded the privilege of a look which, in this instance, should consist of a careful proctosigmoidoscopic examination.

You may be assured that there is but little exaggeration in the foregoing. It is, I am sorry to say, true to life. The causes responsible for such a situation are partly the false modesty of patients in respect to rectal ailments and partly the indulgence of those physicians who permit themselves to arrive at a diagnosis of rectal ailments without making a rectal examination. It might be of service to remember that *not all rectal pains are due to piles nor is all rectal hemorrhage indicative of hemorrhoids.*

540 Park Avenue.

Historical Medicine

Comparison Between the Third and Fourth Eras of Surgery*

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New York.

After centuries of surgery belonging to the first or heroic era in which surgeons did not have competent knowledge of anatomy or of wound treatment there came the second era. Andreas Vesalius may properly be called the father of the second era, although he was subjected to so much persecution that we had to wait for John Hunter before this era was in full swing. It included the idea of the surgeon possessing high degree of knowledge of anatomy and developing manual skill in the performance of surgical work.

Such progress was made that Napoleon's surgeon, Baron Larrey, said that surgery had reached its limitations. Surgeons in the future could look forward to nothing more excepting to acquire knowledge of what was already known and to the perfecting of their personal technic. Since the time when surgery had "reached its limitations" two great eras, each with explosive new features, have appeared and we cannot even hazard a guess as to what the fifth era will be like unless we imagine that it may relate to preventive surgery. By that I mean that we may learn to prevent the development of malignant neoplasms and we may inhibit toxic processes which lead to the formation of gall stones, stones in the urinary system and the development of gastric ulcer for example.

A fifth or preventive era of surgery may perhaps even go so far as to include eugenic control which will avert the deformities belonging to arrested development. Incidentally, it may even extend into traffic regulations in such a way that we shall have fewer automobile accidents.

Right now we are concerned chiefly with the third and fourth eras of surgery. The third era emerged when Lister made surgical application of Pasteur's work with microbes. The principles of the third era included the idea of destroying microbes and of disposing of their poisonous byproducts, but it did not take into account the protective resources of the patient himself. That idea was left for development in the fourth era of surgery, in the course of enlargement of our art. During the third era with the patient himself left out of consideration, the greatest and most rapid advance in this whole history of surgery, up to that time, was made.

Vices which developed were incidental to the virtues. Under the protection of antisepsis and of asepsis, operators who had no right to ever touch a knife engaged in surgical work which required the highest type of technical work on the part of experts. The mistaken idea of glory seemed to go with operative work so that in many localities men who had in no way given themselves opportunities for training as surgeons felt that they must operate in order to retain their dignity in a community. This would not have been possible during the second era of surgery because an extensive knowledge of anatomy would have been essential and in the second place so many patients would have promptly died that the occasional operator would have met promptly with public disapproval. So many of his patients now make some sort of recovery, no matter what is done to them, that it led the late Dr. Maurice H. Richardson to exclaim, "What a pity it is that so many patients recover from the kind of surgical work that is done for them today!"

Another vice belonging to the third era of surgery in which the patient himself was left out of the running consisted in deliberate long continued operative work aided by new confidence in anesthesia. Crile has shown us that destructive impulses are constantly being sent into the centres of consciousness of the anesthetized patient.

Operations of a sort which were sometimes performed in less than a minute during the anatomical era of surgery were frequently drawn out into an hour or more of work during the third era. This vice of deliberate and unduly prolonged operation was finally recognized and classified in its proper position.

Another vice belonging to the third era resulted in perhaps hundreds of thousands of deaths. It was the idea that in abdominal surgery we must remove all pus or other infective material. We had forgotten that patients with appendicitis with abscess, with ruptured gallbladder or even with typhoid perforation, sometimes recovered without operation. If all of us were to know what we have forgotten we would make more rapid progress than we do at the present time. Having forgotten that patients with pus and infective material in the peritoneal cavity sometimes recovered while in the hands of old time medical practitioners, we proceeded to try more or less violent measures when dealing with peritoneal microbes and their products. We forgot that bacteria were at work in the tissues rather than in the fluid byproducts. Washing and wiping of intraabdominal viscera was not only extremely injurious and shocking, but it was unnecessary.

The employment of gauze packing and of extensive drainage device belonged among the vices of the third era of surgery. Long incisions which "exposed all of the pathology" exposed more than that when they extended to the patient's last degree of resistance. Dr. Thomas L. Bennett, the anesthetist who has had experience with very many surgeons, once said: "The best surgeon is the one who acts all the while as though he were afraid of waking the patient up." Much of the violent surgery belonging to the third era had a tendency to wake the patient up and to find himself among

*Read before the Buffalo Academy of Medicine, March 4, 1925.

celestial surroundings. At the height of the third era of surgery in New York, the death rate after appendicitis operations at the J. Hood Wright Hospital, where many emergency cases were received, was thirty-one per cent. Dr. L. W. Hotchkiss, viewing with alarm the death rate according to accepted principles of the third era in this particular field of its application, suddenly turned directly about and applied the principles of the fourth era or physiological era in surgery. As soon as he had done this he had a run of seventy-six consecutive appendicitis operations without a death in the same sort of complicated appendicitis work which had previously given a death rate of thirty-one per cent.

The fourth, or physiological, era of surgery emerged when Metchnikoff and Wright showed us the protective forces of the individual. They told us about phagocytosis, opsonins and gave us an explanation for the recovery of patients from severe infection in the days before we knew anything about microbes. They showed us how patients in ignorance of microbes got well under the care of physicians who were also ignorant on that subject.

When Metchnikoff and Wright reminded us of what we had forgotten in this connection and in addition gave sound instruction about the way in which patients brought their own internal resources to bear we then had the first sunlight which allowed fourth era principles to grow. The fourth era surgeon does not wipe away pus and other discharges from a wound in such a way as to injure the new cell formation beneath. He is not obsessed by any gross idea of cleanliness. He does not try to get all infective material out of the peritoneal cavity, knowing as he does that it would be impossible to do so and furthermore that his attempts at cleansing the peritoneal cavity would so shock the patient that infection remaining might flare up in an uncontrollable conflagration. A fourth era surgeon does not use unnecessarily long incisions or prolong an operation for the purposes of any pretty detail in technic. He completes his work in the most workmanlike manner possible if it does not interfere with the vital processes of the patient. In that latter case he allows his technic to suffer and saves a life by preference. Principles of the fourth era of surgery may be stated briefly by saying that they give the patient home rule. In other words, the patient is turned over to himself in the speediest manner possible and with the least degree of surgery which will suffice for turning the tide in battle between microbe and patient.

114 East Fifty-fourth Street.

Contributors to the Science of Medicine

William Crawford Gorgas

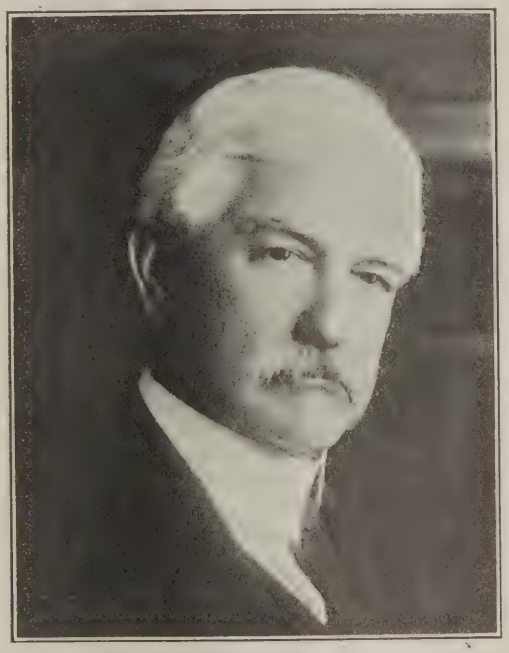
The recent announcement of the definite plans of the Gorgas Memorial Foundation, established to be a living monument to the name of the American physician who will always be remembered in the history of medical science as the man who put an end to the plague of yellow fever, makes timely a sketch of his early life, less well known than his latter years. Within the last few months an interesting biography of Gorgas, written by his wife, Marie D. Gorgas, and his friend, Burton J. Hendrick, has been issued by Lea & Febiger, of Philadelphia, and it is for the most part from this book that the facts given here are gathered.

The name Gorgas suggests a Spanish origin, but if this was true, all account of it has been lost, for when the first Gorgas came to this country in 1680 the family was unmistakably Dutch. They settled in Pennsylvania and intermarried with many of the leading families of that state. The doctor's great grandmother was named Psyche Rittenhouse, and his grandfather married "the beautiful Sophia Atkinson." Their son, Josiah, was the father of William, who was the first child. His mother was a lady of unusual intelligence and charm, Miss Amelia Gayle, daughter of the Governor of Alabama.

William Crawford Gorgas was born on October 3, 1854, in the old Gayle place near Toulminville, near Mobile. His father and mother were both very prominent in social and political circles, and the family spent much time at the capital of Alabama, and at Washington, when Webster, Clay and Calhoun were the leaders of the Senate. Later Josiah Gorgas was assigned by the Government to the command of the arsenal at Augusta, Me., and the family moved thither. It is here that "Willie" appears as a character in the journal that his father kept and is recorded as "very bright, quite grave, and tolerably mischievous and troublesome." He loved swimming, boating and hunting, but the greatest delight of his boyhood was his donkey. In the South he had a little negro boy as his constant companion and playmate, as was the case with most little Southern boys, with whom he had many battles. "At school," writes his wife, "Willie had mighty combats. On one occasion he stood alone against his whole class, the weapons being slates; his sister, Minnie, ably seconded him, piling up ammunition which the boy, sometimes with excellent judgment, hurled at the advancing foe." A military career had always fascinated him. His mother, a very religious woman, was much disappointed when she found out that the reason her son spent so many hours prone on the floor, immersed in the sacred pages of the Bible, was chiefly to revel in the descriptions of the battles of the Israelites.

When the Civil War broke out, there were family difficulties, for Josiah Gorgas was a Northern man and an officer in the Federal army, but his marriage

nto a Southern family and his many years' sojourn n the South had virtually transformed him into a Southerner and a Democrat, so that he accepted all the principles of the South, including slavery. So he decided to ally himself to the cause of the Confederacy and was at once commissioned a brigadier and made Chief of Ordnance in the Confederate forces. William was seven when the conflict began and throughout the succeeding four years constantly haunted the Richmond arsenal, where his father was stationed. When in the end the Union troops swarmed into Richmond after the retreating Confederates, his father as part of the army was ordered to leave. Summoning William, now eleven, he made him realize that the safety of his mother and sisters rested in his hands, and that, since the arsenal, which was near the Gorgas home, was to be blown up, he must lead the others as soon as a certain house caught fire to an uncle's home. The description of this flight is both pathetic and amusing: "He enjoined him especially not to forget the family cow. Soon a considerable part of the city including the arsenal was ablaze, and the sight of the exulting Federal troops coming over the hill added to the excitement. The Gorgas family abandoned their home and started up the street to their appointed refuge; William led the procession, with his invaluable cow tied to a halter; his four little sisters followed, clinging to the skirts of their mother, who held the baby in her arms. The town was full of disorder; a mob of both blacks and whites, stimulated by liquor, was engaging in wholesale plunder, and the fire of a hundred buildings illuminated a scene of riot and horror. Suddenly a terrific explosion took place; the air was full of bursting projectiles; the arsenal had caught fire. Every member of the Gorgas family except one bore the shock with coolness; the one that gave evidence of excitement was the cow, which frantically cavorted right and left, pulling its youthful custodian in all directions. Willie, however, persistently held the rope; amid crackling flame and exploding shells at a corner of two streets a fragment of shell hit the excited animal; she gave one spring into the air, hurling William head first against a cobblestone, and so dazing him that, when he regained his composure, the cow had completely vanished from the history of the Gorgas family. Willie keenly felt his disgrace; he had not fulfilled his father's injunction and he refused to be comforted. 'It's not so bad, Willie,' said his mother. 'Just think, that shell might have hit your baby brother instead of the cow.' 'I thought at the time,' Gorgas said afterward, recalling the incident, 'that women had a greatly exaggerated idea of the value of babies.'"



WILLIAM C. GORGAS

The war reduced the family to dire need, and relatives in Baltimore cared for them until General Gorgas received the appointment of president of Sewanee University, a post which he occupied for ten years. William pursued his education at Sewanee, manifesting while there the two outstanding traits of his character, a deep religious fervor and a zest for military life. Sometimes before going into a baseball game, a sport in which he was very proficient, he would offer up a prayer for victory. His father discouraged him continuously from taking up a military career, but finally gave way and consented to try to get his son an appointment at West Point, but failed in his attempts for various reasons. "Looking back now his West Point failure," writes his biographer, "seems almost like a dispensation, for certainly Gorgas as a cavalry or an infantry officer could hardly have exercised the influence in the world that fate had marked out for him. There was one way, and only one way, in which Gorgas now could get into the army; that was by way of the medical corps. Yet the subject on which he had shown no interest as a young man was medicine. . . . But medicine at this crisis had one advantage that compensated for the mere anatomy, physiology and pathology with which it was encumbered; it was an indispensable part of every military establishment. In order to get near the powder and shell Gorgas was willing to endure this otherwise valueless lumber. Again his father was aghast at the suggestion. Medicine was a great profession—yes, that would be splendid; but an army doctor! The general had become rather familiar with the type in his own military experiences, and the prospect of his son in such a position did not flatter his paternal pride. Yet, as usual, there was nothing to do in face of the boy's quiet insistence. He would be a military man, even though in no loftier light than that of a military doctor. The autumn of 1876 therefore found Gorgas enrolled in the Bellevue Medical College in New York City, living on the modest stipend which his father could send him. . . . The profession which he would never have chosen except as a stepping stone to the army, presently enthralled him. The dissecting room and the operating theatre now began to draw out his finest mental qualities. . . ." He made an excellent record as a student, part of his last year serving on the staff of the mental hospital at Blackwell's Island. He received his degree in June, 1879. After a brief interneship at Bellevue Hospital in 1880 he entered the medical department of the United States Army, and spent the next two

decades of his life in the every day matter of fact career of an army doctor.

It was during the Spanish-American war that his real career began, with his appointment in 1898 as chief sanitary officer of Havana. From that time on Gorgas's story is too well known to need repetition here. The marvelous part of it all is that he was able to succeed and to attain such splendid results in his mosquito extermination work in the face of almost no support, until Roosevelt realized what he was doing, and with very bitter opposition in many quarters from which aid might have been expected. It is of some consolation that honors were heaped on him in the end, and that the name of William Gorgas became known throughout the civilized world.

A Biographical History of Physical Diagnosis.—William Shainline Middleton writes (*Annals of Medical History,* December, 1924) that "tradition traces the beginnings of physical diagnosis dimly back through the centuries before Christ to the empiricists of Egypt and India. However hazy may be this evidence, Aryan practitioners made use of palpation, percussion and auscultation as early as the second century A.D., according to Charaka. Antedating this period by more than five centuries, however, physical diagnosis may be said to take its inception in the Golden Age of Greece, and its founder in the person of the Father of Medicine, Hippocrates." His patent honesty and detailed accuracy have made his contributions immortal. The Book of Prognostics, Book of the Epidemics, and the Aphorisms are believed to have been written by him and are a bountiful storehouse of information. The first reference to clubbed fingers is found in Hippocrates, probably the first description of the Cheyne-Stokes type of breathing, convulsions of the contralateral extremities subsequent to head injuries were remarked, globus hystericus was accurately described, as was also coma vigil, the connection between fistula in ano and phthisis, the form of body peculiar to phthisical complaints, and aphonia was recognized as an accompaniment to tuberculosis. Hippocrates's contributions to physical diagnosis were not limited to inspection. He practised palpation of the abdomen, and immediate auscultation in a rudimentary fashion. He unquestionably recognized râles. Hippocrates's art and philosophy in the practise of medicine are shown in the following quotation: "The physician must be able to tell the antecedents, know the present, and foretell the future —must mediate these things, and have two special objects in view with regard to diseases, namely, to do good or to do no harm. The art consists in three things—the disease, the patient, and the physician. The physician is the servant, and the patient must combat the disease along with the physician."

The passing of Hippocrates in 370 B.C. initiated a seemingly interminable period of inactivity in the development of physical diagnosis. Not until the time of Paracelsus, 1493-1541, was the tide of theorism in diagnosis turned back for the safer ground of observation. Prompted by his devotion to Hippocrates, he, on assuming the chair of medicine at Basel, publicly burned the works of Galen and Avicenna. After Paracelsus, Thomas Sydenham (1624-89) stands out as the reviver of Hippocratic and as one of the greatest bedside physicians of all times. Practical clinical contact and accurate portrayal of disease mark his contributions.

Herophilus of Alexandria (335-280 B.C.) was the first physician to study the pulse. Galen established a system of medicine on the minutiæ of pulse variations. Accurate timing of the pulse was instituted by Galileo Galilei (1564-1642), although Sanctorius is incorrectly credited with this contribution to medical science. Galileo's instrument was the "pulsilogon." Morgagni recorded the first example of heart block, Sir John Floyer in 1707 dedicated "the physician's pulse watch" to Queen Anne, but subsequently the pulse was disregarded for two hundred years until Louis and the Dublin School reinstated routine pulse determination. Galileo invented also the first rude thermometer, but Sanctorius (1561-1636) devised an improved instrument for recording body temperature by the mouth; to him belongs the credit for the first application of thermometry to medicine. Improvements were made by George Martine, Carl Wunderlich and John Hunter, but it was not until 1868 that Sir Clifford Allbutt developed the clinical thermometer to its present form.

With the exception of these two contributions pulse recording and thermometry, physical diagnosis was peculiarly sterile until the time of Leopold Auenbrugger (1722-1809), who added percussion. This method was developed by Jean Nicholas Corvisart. His writings are among the first clinical records of physical findings specifically corroborated by necropsy. He differentiated active from passive aneurysm of the heart, and obviously practised palpation and auscultation in his cardiac studies. The brilliancy of his diagnostic powers is illustrated in a story told of how one day he passed a portrait and remarked that the subject was a cardiac case. Inquiry proved that this was indeed true. "Truly a giant among clinicians, and an able diagnostician and teacher, Corvisart deserves to be ranked as the father of modern objective diagnosis." He died of heart disease. His mantle fell upon Laennec, the inventor of the stethoscope, who established the fruitful field of mediate auscultation. He originated the term cirrhosis of the liver. The work of Corvisart and Laennec was continued by Louis, Piorry, Chomel, Andral and Reynaud. The application of the numerical method to the practice of medicine was one of Louis's great contributions. He was the first clinician to count the pulse routinely, but his greatest service was the spreading of the gospel of exact clinical methods. Piorry's contribution of note was the plexímeter.

Robert Graves (1896-1853), an Irishman, introduced into clinical teaching examination and real care of patients by the students; he first observed the pinpoint pupil and described exophthalmic goitre. William Stokes (1804-78) took Laennec as his guiding star and set himself the task of improving the status of mediate auscultation. He was the first to use the finger as a plexímeter in percussion, and to note the inconstancy of fluid movement in the thorax. The Cheyne-Stokes respiration is rightfully named after him, but the Stokes-Adams syndrome right

fully belongs to Morgagni. Two other members of the Dublin School—Sir Dominic Corrigan and John Cheyne—are famous in diagnosis, the former through his fine monograph on *The Permanent Patency of the Mouth of the Aorta or Inadequacy of the Aortic Valves;* and the latter for Cheyne-Stokes respiration.

The work of the more modern and hence better known physicians discussed in the remainder of Middleton's valuable paper may be suggested by a list of the names included: Sir Richard Bright, famed for his knowledge of nephritis; Sir Thomas Addison, one of the greatest of the teachers of medicine; Johann Lucas Schönlein, who introduced bedside teaching into Germany and was the first clinician to use the microscope routinely in diagnosis; Joseph Skoda, who was partially successful in his attempt to replace the inexact terminology of the French school by a system based on quasiphysical laws; and the Americans, James Jackson, Jr., William Wood Gerhard, and Austin Flint, Sr., (1812-1886) who was ranked as the ablest clinician of his day in America. The writer includes exceedingly interesting biographic sketches of the men discussed. The article is concluded with a reprint of the famous *Stethoscope Song,* by Oliver Wendell Holmes.

The Medicohistorical Movement: Italian Societies of Medical History.—Jean Avalon writes (*Æsculape,* February, 1925) that Dr. Chiapparelli states, in his study of the practice of medicine during the Middle Ages, that for a long time only the monks practised this art. All the monasteries and abbeys had a room where they received pilgrims and the sick. The monks delegated to care for the poor were considered by the faithful as doctors of both soul and body, for the malady was a divine chastisement to be treated with prayers and remedies. The monks probably encouraged these superstitions, for the pilgrimages to their monasteries were a source of considerable income. They also distributed talismans, phylacteries, and other tokens to which a protective virtue was attached. The clergy preached against charlatans, denivers, sorcerers, but upheld superstitious practices, among them the wearing of a string blessed by a priest around the neck of both men and animals. In the hospices and convents the practices were handed down from generation to generation, and in some such way of giving charitable treatment the medical school of Mount Cassin had its origin and played its part in establishing in the tenth century the school of Salerno.

A change came with the decrease of faith and Christian charity, and treatment was given in the hope of material recompense, until the evil became so prevalent that the Council of Rheims in 1131 forbade to the clergy the study of medicine, and subsequent Councils imposed heavy penalties on giving charitable treatment. These measures resulted in the establishment of lay practitioners, some real physicians, others charlatans.

Up to the end of the thirteenth century, doctors prepared their own medicaments. When they had no time, they relegated the job to a son or an apprentice, called a *ministrum medicorum.* The doctor's title was *megister.* This practice of preparing the medicines made it necessary for the physician to have a garden of medicinal plants. There were also in the Middle Ages women *medicæ.* They practised principally at Salerno, but seem to have confined themselves to the treatment of pregnant women and of children.

Sanctorius Santorio, born at Capodistria in 1561, educated in medicine at Padua, practised in Venice. He was in a way the founder of physiology and metabolism. He was the first physician to use the thermometer in illness. His instrument was of the most primitive nature, consisting of a ball of glass filled with air, welded to a tube open at one end which was plunged into a tank of colored liquid. He was the inventor also of the *pulsilogium.* But his greatest fame rests on his balance for weighing transpiration. His book, *Ars de Statica Medicina,* was violently attacked; however, it went through no less than twenty editions between 1614 and 1736.

The writer closes his paper with a brief abstract of an article on the Medicine of India by Vallauri, and quotations from a book review by Dr. Carbonelli of an ancient book on the plague, translated from many languages. One curious feature of the book is a short list of books which the reader is advised to read in the times of epidemics to *soulager l'esprit.* One of the list is *Il Libro delle cento novelle,* which is none other than the *Decameron* of Boccaccio; another is Ovid's *Art of Love.*

Recent Progress of Treatment by Sunlight.—In 1903, Dr. A. Rollier opened at Leysin, in the Alpes Vaudoises, the first clinic for the treatment of socalled surgical tuberculosis by sunlight, Dr. Saleeby tells us in his book, *Sunlight and Health.* In 1910, Rollier applied his idea to prevention by the establishment of his "school in the sun" at Cergnat, near Leysin. In 1914 appeared his book, *La Cure de Soleil,* which was almost forgotten in the war.

In Great Britain, Rollier's methods were taken up and followed by Sir Henry Gauvain at the Treloar Hospital at Alton and Hayling Island, where very simple sheds and solaria achieve the most successful results. In a few other places, among them the Queen Mary's Hospital for Children at Carshalton, at Leasowe near Liverpool, at the Heritage Crafts School at Chailey in Sussex, and at Perrysburg near Buffalo, New York, the sun cure is employed.

Since, however, the bases were lacking for a successful empirical practice, conducted by various clinicians under widely varying conditions and in ignorance, for the most part, of each other's methods, and since no rational statement of the value of heliotherapy seemed available, Dr. Saleeby proposed that a properly conducted scientific inquiry be made into the action of sunlight upon the body in health and disease. This plan was acted upon by the Medical Research Council early in 1922, and appointed a special committee under the chairmanship of Sir William Bayliss to make such an inquiry.

The writer goes on to tell us of successful results of the treatment in the Light Department of the London Hospital, and of his observation of the work in various American laboratories, especially at Columbia University under Dr. Alfred Hess and his colleagues. He believes that the death rate in New York City from pulmonary tuberculosis fell fifty per cent. in the period 1905-9 largely because of the enactment of a sanitary regulation against smoke.

Editorial Articles

ABERNETHY AND THE INTESTINAL TRACT

Evidence is being gathered continually of the clinical acumen and foresight of the practitioners of bygone days. Conditions which are now discussed almost as if little or nothing was known about them formerly, the doctors of one hundred years and more ago had observed closely, in a general way had diagnosed accurately, and had treated effectively.

John Abernethy was one of these pioneers. He was one of the first to recognize the menace of chronic constipation and his methods of treatment were in keeping with the practice of the present day. Mr. Percy Dunn, of London, has an illuminating article on Abernethy in the *Franco-British Medical Review,* March, 1925. In Abernethy's book which he termed *My Book* he wrote at length of the effects of neglected constipation. With regard to constipation he said: "Imperfect digestion must influence the quality of the blood, and all parts of the body may be affected from this source."

Although intestinal toxemia was unknown then at least, not known in those terms of course, he referred to that condition. He also quotes in *My Book* the independent testimony of a French alienist in 1806 in support of his views. This alienist anticipating the modern teaching on the subject, pointed out the determining influence of neglected constipation in the causation of mental disease and insisted on an evacuant treatment as yielding successful results in his hands, affirming also that many other diseases were curable by the same treatment, where disorders of the digestive system were present.

Abernethy pointed out that diseased vascular action, due to continued disorders of the gastrointestinal tract, led to alterations of structure in the irritated parts, which is only another mode of saying that intestinal toxemia causes or paves the way for arteriosclerosis, chronic articular rheumatism, rheumatoid arthritis, and other affections of a like nature.

Abernethy described the postmortem signs of a mucous colitis and showed that these signs were the direct sequelæ of neglected constipation. Further, his definition of chronic constipation agrees with that of intestinal stasis of the present day. He held that a daily action of the bowels was no proof that a person did not suffer from constipation and he also pointed out that the large intestine was more greatly in fault than the small. Abernethy seemed to have observed no mechanical means for delaying the passage of the feces, Sir Arbuthnot Lane was the first to draw attention to kinks. He relied upon calomel to relieve chronic constipation, which he gave in small doses to stimulate the secretion of bile. He was strongly averse to the free use of strong purgatives. He prescribed small doses of calomel about three times a week, combined with a daily dose of some vegetable laxative, such as tincture of rhubarb or infusion of senna.

Abernethy took the stand that strong stimuli will increase the unhealthy conditions of weak and irritable parts. It is possible, too, that calomel acted to some extent as an intestinal disinfectant, although from this point of view its employment has been superseded in recent years by a more reliable preparation by far.

Abernethy expressed views with regard to the origin of cancer practically identical with those held by some authorities at the present time. In *My Book* he says: "Even in cancer, disorder of the digestive organs appears to be antecedent to the local disease, and aggravated by its existence." He adds: "But whether this disorder be the effect or the cause of the constitutional diathesis cannot, I think, be at present determined." It may be mentioned that Abernethy believed in diet as a means for combating disease successfully and especially in constipation, and he was strongly opposed to the gross habits of eating and drinking which were prevalent in his day. Enough, however, has been said to show that Abernethy was a pioneer, and that the clinical experience which the doctors of the old school possessed led them within limits to accurate diagnosis and that while their methods of treatment were not scientific from the modern viewpoint, they were effective. Experience and common sense were their guides.

THE PHYSICIAN AND THE PUBLIC HEALTH

The practice of medicine has changed in the past sixty years and is still undergoing evolution or rather development in the right direction it is to be hoped. Only a few years ago the practice of medicine hinged virtually on curative and remedial treatment and now it is veering towards prevention and preventive treatment. Attention is directed to these changing conditions in the *Boston Medical and Surgical Journal,* December 4, 1924, in a forcible article contributed by Professor Hans Zinsser, being the ether day address delivered on October 6, 1924, at the Massachusetts General Hospital. It is pointed out that it is in the activities of preventive medicine that the

medical profession and the public have begun most thoroughly to understand each other. It is not only that the impossibility of accomplishing lasting results without public confidence has been recognized, but that the intelligent public is making amazing progress in sound comprehension of the principles underlying protective measures, and has learned that these activities are not exclusively the responsibilities of medicine. The main reason for this attitude said Professor Zinsser is that it has long been apparent that in problems in which the medical aspects are intimately interlaced with economic, sociological, educational, industrial and occasionally even religious considerations, the public itself must eventually take the decision, the medical profession merely setting the compass. While preventive medicine has made and is making so great advances in all civilized countries, indeed the stage of civilization attained by any country may be gauged with a fair degree of accuracy by its public health statistics, almost wholly through the cooperation of the public. This state of affairs does not relieve the medical profession of responsibility.

Although the cooperation of all classes of the community is indispensable for success, yet the foundation and underlying principles upon which the structure rests are medical and in addition the central body of workers who give direction, define objectives and furnish information to the specialists must be medically trained. And again, the responsibilities of individual practitioners are enchanced rather than diminished by these developments. For, as the writer points out, the physician represents the first line of defense and therefore seeing that it is the intention of several of the leading medical schools in this country and in Great Britain to infiltrate their teaching with public health information in such a manner that no course is taught, no specialty considered without inclusion of the preventive information pertinent to each subject, he urges with Sir George Newman, the Chief Medical Adviser of the British Ministry of Health, that it is the duty of every medical practitioner to be conscious of this responsibility and to act always from the viewpoint of preventive medicine as the representative in his district of the interests of the community. Further, by virtue of the authoritative position which he occupies in advising them as to the regulation of their daily lives, he constitutes, perhaps, the most important single influence in the delicate and difficult problems of public health education.

It is now in domestic and individual hygiene that the future of preventive medicine will be to a large extent; individual hygiene, dealing, for example, with such intimate questions as venereal disease, and domestic hygiene, dealing with the housing problem.

The physician obviously will be the adviser in such matters more than ever before. As Professor Zinsser states with absolute truth, he who engages in the pursuits of medicine becomes thereby a public servant. The nature of his work has forged his chains and it is his lot to interpret and persuade.

THE SPLEEN

About that of which little is known much is written. Certainly much has been written about the spleen and but little seems as yet to be known concerning its essential function.

The ancients considered the spleen a seat of the passions, hence the expression to "vent one's spleen." Just where it was discharged is much to be guessed, though doubtless through its conspicuous vessels and into the blood (or vital fluid) stream. This, however, was internal and the venter must have benefited more than the bespleened, the person who aroused his wrath, suffered. The spleen was considered a source of melancholy, though old Robert Burton was catholic enough to guess that melancholy might arise from the misbehavior of any organ of the body.

To the clinician the enlargement of the spleen in certain diseases is one of the facts of experience, but this enlargement is by no means explained. Occurring in connection with infection by parasites, it might seem that this organ had for its chief occupation the handling of such organisms, though we believe this theory has never been advanced with any assurance and it is more likely that it is appropriated as a dwelling place by the invaders.

We know that we can get along without the spleen and that its removal is accompanied with comparatively little disturbance, but this only deepens the mystery of its presence. A few years ago the physiologists were content to call the spleen the graveyard of the blood corpuscles, but the organ has fascinated them by its apparent uselessness, and a number of investigations have been going forward recently on its account. Among the theories put forward by only two students are: it may have something to do with the formation of uric acid, it may have something to do with hemolysis, it may have to do with the metabolism of calcium, and it may be a large lymphatic gland.

Bancroft of Cambridge finds that the spleen varies greatly in size in the living and in the dead experimental cat. In the former it is four times larger and he believes it serves as a reservoir, adjusting the amount of blood to the work of the body, particularly in connection with the need for more oxygen carrying capacity. When cut away from its nerve connections it does not so function. Seemingly the ancient and the modern theories confirm each other, for when one "vents" his spleen in the old way there is

always a firing up of the organism and consequently a concomitant need for oxygen. It will be interesting to look forward to the results of further study on the subject of the physiology of this organ. Certainly it will be kept busy meanwhile in doing everything that physiologists have surmised it to be capable of accomplishing.

INTESTINAL OBSTRUCTION

Intestinal obstruction seems to have increased within recent years as a cause for operation and of mortality. After a certain age its occurrence is fairly frequent and its results are too often fatal. In the *Boston Medical and Surgical Journal,* April 23, 1925, Dr. Howard K. Tuttle, of the Ancon Hospital, discusses the mortality of intestinal obstruction from his experience of one hundred and fifty cases coming to operation or autopsy. The object of the paper is to determine if possible how the excessive mortality rate may be reduced.

It is pointed out that it has been learned from animal experimentation and operating room observation that toxic substances are formed in the proximal segment of the blocked intestine, that the higher the obstruction the more toxic are the substances, that this toxic material is not readily absorbed through a normal mucosa but as soon as distension and consequent interference with the circulation occurs absorption in overwhelming doses follows. Death in various forms may result from this septic absorption and treatment to be effectual must be so directed as to prevent the occurrence of any condition which threatens life and according to Tuttle the only method is by early surgical interference.

There is, of course, no doubt that in these conditions, as in practically all conditions in which reliance must be placed on operation, this treatment is delayed too long. And it is not always delay on the part of the patient that is at fault, but, as Tuttle shows, delay and procrastination on the part of the surgeon may be the cause of excessive mortality in acute intestinal obstruction.

The author thinks that acute intestinal obstruction follows appendectomy more often than any other abdominal operation and he advises that suppurative cases are best drained along the posterior parietal peritoneum by a McBurney incision close to the anterior superior spine even though the abdomen has been opened through the right rectus muscle or in the midline. However, while there are many precautionary measures to be taken during and after operation which tend to render it safer, after all the best chances of success lie in early diagnosis and prompt surgical intervention. Tuttle holds that operation is indicated even when intestinal obstruction is suspected, as by operating on early symptoms and physical findings it may be found occasionally that intestinal obstruction does not exist but the death rate will be reduced substantially in those cases which if observed for another twenty-four hours all doubts as to diagnosis will have disappeared.

Early operation is easy and comparatively safe while late operations are in a high degree dangerous. Therefore it is urged it is better to take some risks of wrong diagnosis than to leave the case until operation is hopeless. Also be it noted it is remarkable with how great rapidity postoperative cases can develop into what are practically obstruction cases beyond the skill of the surgeon.

DIET IN THE PREVENTION OF DISEASE

It has been stated by many authorities that diet is the cause of more disease and conditions of ill health than any other cause. Evidence has seemed to accumulate to show that the diet of civilization is especially prone to cause disease. An indictment has been framed against much of the food eaten in modern life on scientific and clinical testimony. It has been observed that diseases of various kinds follow the consumption of certain foods even when eaten in moderation.

Clinical observation and science have gone hand in hand in the attempt to solve the problem of diet in relation to disease. In this country the science of dietetics has made the greatest progress and, perhaps, the majority of medical men of the present day here learn something of the therapeutics of food and drink in their student days. In some countries little attention is paid to the subject while in others it languishes.

With the praiseworthy object of arousing interest in the matter, the controlling editor of the *Practitioner* collected a series of papers from distinguished British authorities on diet which were published in the January number. Several of the papers are given over to the consideration of the vitamines and these are verbally analyzed and discussed in the most thorough manner. Sir William Wilcox deals with dietetics, vitamines and food reform, emphasizing the point that the public in mass are profoundly ignorant of food values and of the dangers lurking in food from various viewpoints and that public opinion sadly needs education in this direction. Professor F. Gowland Hopkins, professor of biochemistry in the University of Cambridge, a pioneer in biochemical research, points out the criteria of an efficient diet and explains clearly, exactly what is known of the vitamines and the limitations of our knowledge in this respect. He shows that what definitely emerges from modern research is the

truth that diet may be faulty when it is abundant, and that ill health may arise from ill nutrition much more frequently than seemed likely when the criteria applied to foodstuffs referred to quantity and digestibility alone.

Professor Plimmer, professor of chemistry in the University of London, deals with vitamine problems in nutrition, somewhat exhaustively pointing out among other valuable facts that under all variations of vitamine shortage experimental animals are more susceptible to infections of all kinds. A very instructive paper is contributed by Dr. John Boyd Orr, director, Rowett Research Institute, Aberdeen. Dr. Orr attributes most of the dietetic ills which inflict mankind to ill balanced mineral metabolism, and draws attention to the bad effects which follow deficiencies in a diet of calcium, phosphorus and iodine. Deficiency of iodine in the vegetation is believed to be the cause of athyreosis in certain inland districts in North America. Also he alludes to the prevention of simple goitre by the administration of iodine, although he is careful to note that the correlation between the deficiency of iodine in the vegetation on drinking water to goitre has not been definitely established. He refers to the predisposition to infectious diseases which is a feature of defective mineral metabolism among animals. Iodine deficiency accompanied by a depletion of the thyroid of this element appears to be associated with decreased reaction to certain toxemias. In tuberculosis there is usually a negative calcium balance presumably as a result of an abnormal metabolism due to the toxemia.

Dr. Leonard Williams, a trenchant writer, indicts present day foods of civilization and the methods of preparing the same in a paper entitled The Scandal of Present Day Dietetics. He deplores the ignorance on the subject of the medical profession and the laity and almost suggests that dietetics should be made a compulsory subject for medical students, and thinks that the present overburdened curriculum could be lightened profitably by sacrificing some of the pharmacological and other superfluities which in his opinion do much present harm by creating a fake atmosphere. His argument is that if young medical men were turned out thoroughly equipped in the principles of rational physiological feeding, their knowledge would quickly permeate all classes of the community and the present ignorance in action would be replaced by science in operation. Dr. Williams takes a tilt against the kind of meat and sugar we eat and indeed finds little to be said in favor of our present day diet. Moreover, he is an avowed and strong believer in uncooked food as far as is possible and pins his faith on cheese, fresh uncooked vegetables and fruit. He takes the stand that people who eat natural foods never eat too much, because their palates are unstimulated, and their physiological needs quickly satisfied.

Dr. C. Henning Belfrage, who gives some practical hints on dietetics, is a believer in uncooked food, averring that vegetables and meat are generally cooked to death, so far as their vital elements are concerned. He holds that the nursery and school must be the focus of attention; food habits, like other habits formed in childhood, will tend to become fixed for good or ill.

Dr. N. Mutch shows the relationship between diet and toxemia, pointing out *inter alia* that the practice common among certain sections of the community of mincing the cold remains of the Sunday's joint and recooking it later in the week is a fruitful cause of food poisoning. Lieut. Col. McCarrison, I.M.S., tells of his experience of the effect of various diets in different parts of India. Lieut. Col. Hallilay also writes of diet in India; both these papers are illuminating and are calculated, perhaps, to cause a revision of some of the established tenets with regard to the effects of diet.

In considering the question of diet some of the points which appear to be overlooked are that both climate and occupation profoundly influence the effects of diet. A strong, vigorous man working out of doors in the fresh air needs a different kind of food to one who works indoors and to one engaged in a sedentary occupation indoors. Climate again has a distinct bearing on the subject and the personal equation and individual idiosyncrasy must not be lost sight of. However, when all allowances have been made it seems that regarding the matter from a broad outlook that the diet of civilization fails in several essential features and that reforms in this direction will be to the advantage of the community at large. Education is required with respect to many unsettled points of the diet problem and it is the medical profession which must educate the public to eat wisely and well.

NATIONWIDE RECREATION

The development of the spirit of sport and fair play through games and outdoor diversions, and above all of health, tending to the making of good citizens, are perhaps the chief reasons for organized recreation. That this need of our urban dwelling nation is becoming more and more recognized was shown at the National Conference on Outdoor Recreation, held in Washington last May, where it was reported that in more than four hundred of our cities of more than eight thousand population no provision whatever is made for playgrounds, and the same is true of the congested sections of many of our larger cities.

Mr. Theodore Roosevelt presided at the conference, which was attended by many of the cabinet officers and other Government officials, as well as by representatives from many organizations interested in a nationwide recreational movement. Among the problems discussed were the widest possible practical extension of recreational facilities, the contribution of recreation to the development of the individual citizen, the employment toward this end of our parks, forests and other public reservations, national, state and local, to their fullest extent, and the necessity of taking means to preserve what is left of our fast disappearing wild life.

Among addresses at the conference, that of Major William A. Welch outlined some of the things New York is doing to promote enjoyment and profit from outdoor life.

Dr. William A. Hornaday, director of the New York Zoological Park, told of the five million five hundred thousand hunters who go out each year to kill all the game they can find, and prophesied the production in the not far future, if present conditions are allowed to persist, of a devastated country with treeless slopes and mountains, forests reduced to stumps, drained mud flats instead of lakes, poisoned streams, and an utter lack of wild life. The president of the Izaak Walton League spoke of the peril of draining such large areas as are under operation today, for thus the waterfowl are deprived of their homes and breeding places, the migratory birds of their great highways, and the warm water game fish of their last stand for existence.

Pleas were made for the protection from any form of desecration and putting to commercial uses of our present eight million acres of national parks, for the extension when practical of these, and of similar state and local reservations, for the satisfying of perhaps our greatest national need along this line—the provision of many more city parks, town forests, school playgrounds, open squares and the like; for all these add to the joy and fullness of life in serving as museums of noble scenery and wild life, in providing recreational resources, and protecting the water supplies of towns and cities.

The conference effected the organization of a permanent National Council of Recreation, the purpose of which is to survey the whole field, outline practical policies, serve as an exchange bureau of information on the subject, recommend further organization when and where necessary, and foster and plan the cooperation of governmental and private agencies, all to the end of inspiring an acquaintance and intelligence interest on the part of the public with the pleasurable and beneficial aspects of outdoor recreation, and of providing and maintaining in all localities the resources for such enjoyment.

QUEEN ELIZABETH'S DOCTOR

In the Elizabethan era it was the custom for doctors to compound and sell their most valuable medicines. The common drugs were sold to the patients by the apothecaries, who were little more than grocers, though it happened sometimes that an ambitious apothecary would pick up enough information about herbals and empirical compounds to vie with the ignorance of doctors of those days.

Dr. William Bulleyn, physician to Queen Elizabeth and author of *The Book of Simples* and *Dialogue Between Soarnes and Chirurgi,* gave the following rules for an apothecary's conduct: "Must fyrst serve God, forsee the end, be clenly, pity the poore. Must not be suborned for money to hurt mankynde. His garden must be at hand with plenty of herbes, seedes and rootes. To read Dioscorides, to know ye natures of plants and herbes. To invent medicines, to chose by coloure, tast, odour, figurie, etc. That he may open wel a vein to help pleuresy. That he delyte to reede Nicolaus Myrepsus, Valerius Cordus, Johannes Placaton, the Lubik, etc. To remember his end, and the judgement of God: and thus I do commend him to God, if he be not covetous or crafty, seeking his own lucre before other men's help, succour and comfort."

The Queen gave her physician £100 per annum and diet wine, wax, etc., as perquisites, and her apothecary's bill of which some of the items were: A confection made like a manus Christi, with bezoar stone and unicorn's horn—eleven shillings. Rosewater for the King of Navarre's ambassador—twelve pence. A conserve of barberries with preserved damascene plums, and other things for Mr. Ralegh—six shillings.

Pearl mixtures were very popular among the more wealthy patients; we may presume that Bulleyn's recipe for Electuarium de Gemmis would be extra to his yearly stipend! Here is the recipe: Electuarium de Gemmis.—Take two drachms of white perles; two little peeces of saphyre; jacinth, corneline, emerauldes, grannettes, of each an ounce; setwal, the sweate roote doronike, the rind of pomecitron, mace, basel seede, of each two drachms; of redde corral, amber, shaving of ivory, of each two drachms; rootes both of white and red behen, ginger, long peper, spicknard, folium indicum, saffron, cardamom, of each one drachm; of troch, diarodon, lignum aloes, of each half a small handfull; cinnamon, galinga, zurabeth, which is a kind of setwal, of each one drachm and a half; thin peeces of gold and sylver, of each half a scruple; of musk, half a drachm. Make your electuary with honey emblici, which is the fourth kind of mirobalans with roses, strained in equall partes, as much as will suffice. This healeth cold diseases of ye braine, harte and stomack.

News Items.

Hospital Directory.—A list of hospitals and fixed clinics in New York city with transportation guide, has been issued by the New York Academy of Medicine. Three maps are included in the volume.

New Municipal Hospital.—The city administration is taking steps to acquire a site and erect a $1,200,000 hospital, with accommodations for one hundred beds, in the southern part of Bronx, to take the place of the Lincoln Hospital.

Columbia to Take Over Patents.—Columbia University is to take over patents for discoveries made in its own laboratories, in order to protect the inventor and the public, and to enable the university to share in the profits for the promotion of research.

Delegates to British Meeting.—Dr. William D. Haggard, president of the American Medical Association, Dr. George E. DeSchweinitz, of Philadelphia, and Dr. Howard Fox, of New York, have been appointed delegates from the American Medical Association to the British Medical Association meeting, to be held in July, at Bath, England.

Industrial Hospitals.—The Manufacturers' Association of New Jersey announces that it intends to establish six hospitals to provide "more efficient and less expensive medical treatment" for injured workmen. These hospitals will be established in Newark, Paterson, Trenton, Jersey City, Camden, and some other city. A company known as the New Jersey Manufacturers' Hospitals, Inc., has been formed. According to newspaper reports, this move has been due to increased medical fees.

New York Tuberculosis Society.—At the annual meeting of the New York Tuberculosis Association, figures were presented showing a fall of three per cent. in the mortality rate in 1924, the rate being 93 in 100,000, which may also be compared with a rate of 196, ten years ago. In some parts of Brooklyn a rate was reported as low as 39. Tuberculosis is now fourth instead of first in the city's death list. Officers elected at the meeting were: Dr. James Alexander Miller, president; Mr. Homer Folks, vice-president; Dr. Nathan E. Brill, secretary, and Mr. Thomas W. Lamont, treasurer.

Thromboangiitis Obliterans Study.—The recently organized committee for the study of thromboangiitis obliterans, of which Dr. Reginald H. Sayre is chairman, and Dr. Benjamin Jablons, vice-president, has appointed subcommittees for ways and means of obtaining funds, for preparing a questionnaire to ascertain frequency of the diseases and methods of treatment, for research into the etiology of the disease, and for study of its clinical aspects and differentiation from simulating affections. A contribution of five hundred dollars has been received from Mr. B. M. Maltz of Brooklyn, who has been a sufferer from the disease.

Travel Study Club of American Physicians.—The Travel Study Club of American Physicians at its ninth annual reunion, reelected Dr. Louis Livingston Seaman and Dr. Richard Kovacs of New York respectively as president and secretary-treasurer; Dr. Edward B. Heckel, Pittsburgh, Pa., Dr. J. P. Lord, Omaha, and Dr. F. H. Albee, New York as vice-presidents. The club has decided on a 1926 study tour to London, Paris, Switzerland, Munich, Vienna and Berlin. Participation in this tour will be limited in number and restricted to members and medical friends recommended by them.

Venereal Disease.—The Division of Venereal Diseases of the New York State Department of Health will hereafter be called the Division of Social Hygiene. It is felt that the educational activities of the division have been handicapped by the former title.

A special meeting of male employees of the Atlanta, Birmingham, and Atlantic Railway Company was recently held in Fitzgerald, Georgia. The company issued free transportation for over six hundred, and fully twelve hundred people attended the meeting. The meeting was arranged by the Georgia State Board of Health, and Dr. W. H. Gillette of the Public Health Service delivered an illustrated lecture on sex education and venereal disease.

The General Federation of Women's Clubs arranged an exhibit on social hygiene in connection with the conference of the International Council of Women, recently held in Washington.

Research in Foot and Mouth Disease.—Dr. Peter K. Olitsky of the Rockefeller Institute, Jacob A. Traum, D.V.S., University of California, and Dr. Harry W. Schoening of the Bureau of Animal Industry have been selected by the U. S. Department of Agriculture to conduct research in Europe on the foot and mouth disease. Studies will be made in Berlin, Budapest, and Alfort, France.

Institute of Public Health.—Earle B. Phelps, formerly of Massachusetts Institute of Technology and the Hygienic Laboratory of the Public Health Service, has been appointed head of the department of sanitary science of the Institute of Public Health of Columbia University, founded under the will of the late Joseph De Lamar. Dr. Haven Emerson is head of the department of public health administration, the first group to be started.

East Side Clinical Society.—A new society, known as the East Side Clinical Society, has been formed, unique in character, as only cases, instruments, and specimens are presented. The officers are: President, Dr. Joseph Van Den Berg; first vice-president, Dr. Hyman Goldstein; second vice-president, Dr. Rubin A. Gerber; corresponding secretary, Dr. Jacob Daley; recording secretary, Dr. Joseph Salan; and treasurer, Dr. Ralph L. Dourmashkin.

Annual Health Officials Conference.—Health officers and public health nurses of New York state will hold a conference at Saratoga Springs, June 23d to 25th. The conference will be opened by Dr. Mathias Nicoll, Jr., commissioner of health, and addresses will be made by Governor Smith, Dr. J. W. S. McCullough, chief health officer of the Ontario Provincial Department of Health, and Dr. Nathan B. VanEtten, president of the New York State Medical Society.

Society News.—The American Psychopathological Association has elected the following officers: Dr. Smith Ely Jelliffe, New York, president; Dr. Ross M. Chapman, Towson, Maryland, and Dr. Edward J. Kempf, New York, vice-presidents; Dr. Sanger Brown, 2d, New York, secretary, and Dr. William C. Garvin, Binghamton, New York, treasurer.

The American Urological Association has elected the following officers: Dr. John R. Caulk, St. Louis, president-elect; Dr. Homer G. Hamer, Indianapolis, secretary; and Dr. James B. Cross, Buffalo, treasurer.

The American Gynecological Society elected the following officers at its recent meeting in Washington: President, Dr. Franklin S. Newell, of Boston; first vice-president, Dr. Hiram Vinberg of New York, second vice-president, Dr. C. Jeff Miller, of New Orleans; secrtary, Dr. Arthur H. Curtis, of Chicago; and treasurer, Dr. Charles C. Norris, of Philadelphia.

Personal.—Dr. Hideyo Noguchi of the Rockefeller Institute has been awarded the Kober Association Medal.

Dr. William S. Elkin, who has been dean of the Emory University School of Medicine, in Georgia, for seventeen years, has been elected emeritus dean and emeritus professor of obstetrics and gynecology. Dr. Russell F. Oppenheimer, superintendent of Wesley Memorial Hospital, has been appointed dean.

Dr. Norman Titus, of New York, is to serve as delegate from the American Electrotherapeutic Society to the International Congress on Radiology and Physiotherapy, to be held in London in July.

Dr. William A. White, of St. Elizabeth's Hospital, Washington, was the speaker at the graduation exercises of the Long Island College Hospital.

Dr. Haven Emerson, of New York, spoke on Periodical Health Examinations at a meeting of the Hudson County Medical Society, Jersey City.

Dr. Charles H. Frazier, of Philadelphia, spoke before the Brooklyn Surgical Society and the Medical Society of Bay Ridge, on trigeminal neuralgia, presenting several patients.

Dr. J. F. Montague, of New York, spoke before the Aesculapian Society of Philadelphia on Pruritus Ani demonstrated by motion pictures.

Dr. Channing Frothingham, of the Harvard Medical School, spoke on Classification and Treatment of Acute and Chronic Nephritis, at a joint meeting of the honorary medical society Alpha Omega Alpha and the Syracuse Academy of Medicine, May 20th.

Dr. Walter T. Dannreuther, formerly associate professor, has been made professor of gynecology in the New York Post-Graduate Medical School and Hospital.

Foreign Correspondence.

LONDON LETTER

(From our own correspondent)

LONDON, *May 14, 1925.*

DISCUSSION ON ENDOCRINE THERAPY

A special discussion on endocrine therapy was opened at the Royal Society of Medicine, London, on March 31st. Dr. Langdon Brown dealt with the subject from the clinician's point of view. He said that there were five methods of administration of endocrine substances. The oral method was very uncertain except in a few cases of pituitary administration, in which it was difficult to exclude the element of suggestion. The nasal method was originally investigated as a result of the suggestion that this might be a more advantageous route for pituitary preparations since the pituitary itself was an outgrowth of the nasal mucosa. A fair degree of success had been obtained in the treatment of diabetes insipidus in this way, and there was a possibility that adrenalin also might be absorbed by this route. Rectal injection had had a measure of success in selected instances, but subcutaneous injection remained the most effective method of introducing all the substances concerned. Grafting and transplantation were still on trial; the ingrafted material was treated as a foreign body and absorbed so that the action could be but temporary. The results seemed to be better if the graft were placed in some homologous tissue, as, for instance, the insertion of adrenalin grafts into the testis, which method had been known to produce a continued life in the graft for over two years.

It would be of great advantage if some biochemical tests could be devised to form a standard for investigation of the action of these substances; at present there was only the basal metabolic rate and the blood sugar. The difference of opinion between the clinician and laboratory worker was partly due to the credulity and overreadiness of the former to acclaim untried therapeutic agents and partly to the fact that the laboratory worker was able to reduce his problem to the simplest possible terms, so that he was liable to forget the much more complicated and delicate adjustments with which the clinician had to deal. Scepticism had even gone so far as to deny the interactions between the endocrine and autonomic nervous systems, but there seemed little doubt that the cooperation between the adrenal, thyroid and pituitary glands on the one hand, and the pancreas and the parathyroid on the other, and their mutual antagonism, was supported by a considerable body of experimental evidence.

It must be admitted, however, that if polyglandular therapy had a rational basis it was often irrationally applied. The thyroid was the gland most widely and easily administered; the original doses were now known to be too large. It was of value for children who showed a failure of growth, nocturnal enuresis, night terrors, ligamentous relaxation, etc. Parathyroid had a great function as a catabolic agent; if its normal secretion were diminished there was an accumulation of waste tissue in the body. It could be absorbed when given therapeutically, producing a great rise in the calcium content of the blood. Adrenal substance seemed to be of little use in substitution therapy; its value lay in its pharmacological action as a local anesthetic and hemostatic, in the reduction of spasm and in asthma. It seemed that pituitary might be absorbed by the stomach, but its value as a substitute was doubtful; it might relieve the symptoms of Frőhlich's syndrome and of adiposity, and it was valuable in diabetic conditions and as a stimulant to plain muscle and heart muscle. The use of insulin in diabetes was proved, and the impression that its administration must be for life should be strongly contradicted; many patients were able to return to normal life without the continuance of the drug. Ovarian extract had also proved its value, but the present preparations were not wholly satisfactory. It must be free from corpus luteum and might be of value in thymic asthma and transient glycosuria. Orchitic substance was more doubtful; it was as yet too soon to judge of the value of the grafting methods introduced recently.

Mr. Leslie Pugh, a veterinary practitioner, said that the use of endocrine substances in veterinary work did not differ materially from that in medical work. Pituitary was used in obstetrics and thyroid in a variety of conditions. Corpus luteum extract had been used for sterility in cattle. Insulin had been used for the hyperglycemia and ketosis of cattle.

Mr. Kenneth Walker confined his remarks to the effects of testicular extract and grafts. It might be said quite definitely that the oral administration of testicular extract was absolutely useless; all experiments had been negative. Experiments with grafting were rendered difficult by the scarcity of material and the necessity for careful technic to insure vascularization. Voronoff claimed valuable results from his work on the testes of apes, but it seemed that the improvement was either in the nature of an increase of muscular and mental vigor and general well being and growth of hair than any specific action on neurasthenia or sexual disabilities. Mr. Walker himself had done transplantations with human material used much the same technic as Voronoff and implanting the graft in a serous cavity where it was nourished by the rich exudate until vascularization could take place. In his experience the grafts survived for two or three months but there was degeneration of the tubules into cords and the cells repressed to an embryonic condition. Death of the graft did not necessarily mean loss of all the benefit. It might be that the secretion supplied by it tided the patient over a critical period while the compensatory function of the other glands was being established. It must not be forgotten that the testis was seldom the whole seat of the trouble; there was a reciprocal involvement of other glands and structures which could not be affected by a graft. The operation of ligature of the vas deferens led to marked sexual excitement and increase in the interstitial cells of the testis. Steinach's results were impressive, as the life period was undoubtedly increased in rats, although relapse occurred inevitably sooner or later. In man the results were much less certain; in some cases there seemed to be no benefit, in others an improvement in the general health. It was by no means certain that the internal secretion of the testis came

rom the interstitial cells, but this did not nullify the experiment. Mr. Walker had himself done fifteen such operations, and although it was difficult to eliminate the element of suggestion it seemed that there had been improvement in thirty to forty per cent. He advised the operation in paralysis agitans, as two out of five cases he had operated upon showed marked benefit therefrom.

Mr. H. Crichton-Miller pointed out the importance of the endocrine gland secretions from the subjective aspect. There was much need for evidence as to their effects for functional sufferers especially. He and the staff at his clinic were about to make experiments on the subject. Some members of his staff and medical volunteers would consume certain tablets and report results.

Mr. J. E. R. McDonagh spoke of the effects of those glandular extracts with which he had experimented on animals—i. e., adrenalin, thyroxin, insulin and ageratin (testicular extract). His object in this research was to ascertain the effects of drugs on the blood and organs and so to arrive at a basis for their chemotherapeutic employment in man. Many of the extracts were derivatives of the amino acids. Though the amino was the most active group, the action of the compound depended really on the way in which this group was checked. Adrenalin caused the protein particles in the plasma to increase in number, and then to go into solution, and this dual action of conduction and dehydration caused constriction of capillaries and a consequent rise of blood pressure.

The action of adrenalin was not specific, he said. Insulin caused hydration of the protein particles, and adrenalin proved to be an antidote because it caused dispersion of the hydrated particles. When protein particles increased in size they were likely to be precipitated in capillaries, and if in the cerebral ones, fits and convulsions ending in coma ensued; while when this took place in the lungs there was the pulmonary form of shock. Adrenalin was not powerful enough in these conditions, and it should be substituted by glucose injected intravenously and oxygen injected subcutaneously. Adrenalin was apt to fail as a styptic, because its later action of dehydration caused coagulation to be retarded. Thyroxin caused a slower dehydration of protein particles than adrenalin, hence it was more valuable in chronic diseases; in the chronic stages of disease the protein particles increased in size and became independent. In his view, malignancy was simply an expression of protein hydration. When the particles gradually increased in size, thyroxin could break them up. Its action could be enhanced by the simultaneous employment of colloid iodine. Insulin caused hydration of the protein particles, and its action was not specific; its effect could also be produced by certain synthetic organic preparations of sulphur. Insulin was an excellent antidote against any powerful dehydration. An acute bacterial infection might cause such profound dehydration as to call for insulin, the drug best suited to bring back to the colloidal state those protein particles which were passing into true solution. Insulin could also be employed with advantage in cases of anemia associated with a great destruction of the red blood corpuscles. With regard to operation, he said that he did not know anything of the chemistry of the compound, but its clinical behavior suggested that it might be a phosphatide, related to cephalin. Ageratin protected an animal against infections, interfered with the antigenic action of the organic extract in the Wassermann reaction, and reduced the precipitating effect of a positively reacting serum. When once in the system, this drug should prove useful in protecting man against the invasion of parasitic and chemical reagents.

Dr. M. B. Ray dealt with the many early beliefs associated with the influence of various foods and drugs on the health and endurance of the individual, and expressed his belief that the ductless glands exerted a powerful effect on the body metabolism. He pictured various types of cases which were held to be significant of deficiency of one or other of these important secretions, laying particular stress on the relation of goitre to rheumatism in young girls of ten to fifteen years of age. He said that in localities where goitre was endemic, the incidence of rheumatic fever, cardiac rheumatism, and rheumatoid arthritis was abnormally high.

Prof. Swale Vincent was pessimistic as to the value of the oral administration of preparations of the ductless glands with the exception of those of the thyroid. He deplored the lack of exact knowledge regarding the pituitary and adrenals and was not favorably impressed by the observations of Mackenzie Wallis on the blood sugar curves, and he was unfavorably impressed by those of Prof. Dixon. Much more scepticism was needed by the practising physician on these matters. One never knew what would happen if a certain treatment was not adopted, and until the normal curve and incidence of a disorder was known, it was dangerous to assume that a certain remedy given had been efficient, and it was especially dangerous to give a mixture, as was often done, and attribute a result to one particular component of that mixture. There were many pitfalls in therapeutics, and in endocrinology more than in any other department.

RICKETS AND DIET

A section of the medical profession here told that rickets is caused by lack of sunlight and unhealthy environment and ignore almost wholly the factor of diet. In the *London Times*, April 13th, a correspondent points out that owing to better and more suitable food, the manifestations of rickets in London are less obvious than formerly. He goes on to join issue with those who take the stand that rickets is not a dietetic disease and draws attention to the fact Professor Mellanby has demonstrated that diet is the fundamental basis of rickets which conclusion was confirmed by the investigations of Miss Harriette Chick and a British staff who were sent by the London Lister Institute and the English Medical Research Council to Vienna after the war and who pursued their researches there for a period of three years. It seems as Dr. Eric Pritchard, director of the Infants' Hospital in London, and others believe that diet, lack of sunlight and unhealthy environment all play parts in the production of rickets, and that to state dogmatically that want of light, bad housing and unhealthy surroundings are the sole causes is to argue against ascertained facts.

A NEW BOOK ON CANCER

A useful little book on cancer has been published recently by Kegan Paul, London, G. P. Dutton & Co., New York. It is entitled *The Conquest of Cancer,* is written by H. W. S. Wright, M.S., F.R.C.S., with an introduction by F. G. Crookshank, M.D., F.R.C.P. The introduction is informative in a high degree and explains much about the disease which is overlooked or ignored. Mr. Wright stresses the importance of early diagnosis, stating that this is by far the most important factor in the cure of the disease and claims that if the public were educated to the point that each individual took as great care to prevent cancer as he does to prevent dental sepsis, ninety per cent. of the cases of cancer would be prevented. It must be borne in mind that education of the public with regard to care of the teeth developed slowly, at any rate, in this country. By persistent efforts there is no reason why similar results should not be brought about in the case of cancer.

Letters to the Editor.

THE VENEREAL PROBLEM IN ENGLAND

To the Editor: LONDON, W. I., *April 21, 1925.*

As some Americans are still under the delusion that London has something to teach New York in the matter of the management of the venereal problem, it would be well at this stage to record the bare facts of the case, as they appear to an independent lay observer like myself, who has been resident in England continuously for several years.

1. In England voluntary treatment at public expense is provided for men, women and children, innocent and guilty alike. It is officially claimed that this provision reduces the number of persons suffering from disease. Hence that it is a form of prevention as well as cure.

2. Undoubtedly the system does clear up a large number of sources of infection, and thus save much danger and misery to the individual and to the community. But the majority of these free patients (sometimes from sixty to seventy per cent. of them) fail to continue attending long enough to be cured or even to be rendered noninfective; and there is no official followup system, no compulsory notification, and no compulsory treatment in England.

3. More fresh infections and late cases were recorded at the free clinics during the years 1919-1921 than during the years 1922-1924. But the first three year period included many "war cases"—soldiers demobilized while still infective and diseased, some of them comparatively late cases, and their "contacts" (innocent women and children and others).

4. Some patients now continue their attendances for longer terms than previously, thus slightly improving the community's chance of obtaining protection in exchange for heavy expenses incurred. These attendances are swelled by the inclusion of "incurables" and "chronics." In any case the free treatment system is now claiming more—not less—professional service. This is quoted as an "improvement."

5. There is a growing opinion among medical practitioners and the intelligent responsible lay public that the provision of free voluntary treatment for venereal diseases for all and sundry, leads to the neglect of sexual cleanliness and of selfdisinfection and to the encouragement of further risks. It has been found that some clinics are used by habitual libertines who report for early treatment of gonorrhea, returning two, three and even four times with fresh infections.

6. The policy of the Ministry of Health is to provide treatment and prohibit prophylaxis—for ecclesiastical and political reasons; and this policy is bolstered up by subsidizing the National Council for Combating Venereal Disease. This is a political society which receives annually from the Ministry of Health thousands of pounds on condition that it advocates the policy of early treatment rather than prophylaxis. A medical society (the Society for the Prevention of Venereal Disease) which endeavors to teach the public to rely on prophylaxis rather than treatment is denied all financial aid.

7. The Government subsidy to the National Council is expended partly in advertisements in the newspapers and magazines, which advertisements the council threatens to withdraw if the editors of the papers or their contributors advocate selfdisinfection; thus English public opinion is "formed." Part of the subsidy is spent in salaries and other emoluments for a clique of medical and lay officers, who naturally work to protect their own jobs; and the remainder of the annual subsidy is expended in printing pamphlets very few people read or giving lectures very few people attend. Some good is probably done by encouraging diseased persons to seek treatment. Variety is added to the work of the National Council by occasional joy rides, called "Enquiries." These are useless investigations regarding the spread of Christian syphilization among the "heathen" in the West Indies or in the Far East.

8. Theoretically the Ministry of Health accepts the prophylactic station, but actually there are no prophylactic stations in England, either for men or for women. Preventive treatment is sought in a few cases at the free clinics. There is not teaching of selfdisinfection to those who have previously risked infection, nor even to those who have contracted disease. Thus the majority of those engaging in irregular intercourse or risking infection in marriage, being denied prophylaxis, trust to luck. A few careful ones buy rubber sheaths—if they can afford it.

9. Only the fringe of the venereal evil in England is being touched by the free clinics; other cases are treated by private doctors, by quacks, or not treated at all. The number of cases of syphilis treated at the clinics often exceeds the number of cases of gonorrhea, although we know there are approximately three or four times as many of the latter hence from three fourths to four fifths of the venereal disease cases in England are concealed, so far as the official returns are concerned. The number of diseased women (married or unmarried) receiving any kind of treatment is negligible. Thus many English homes are festering in secrecy.

10. In 1917 an act was passed by the British Parliament called The Venereal Disease Act of 1917. It was intended to stop quack tratment and the sale of quack remedies. Unfortunately the word "prevention" was inserted by some morbid fanatics and it slipped through Parliament. This subsection 2 of section 2 now reads as follows:

"On and after the first day of November nineteen hundred and seventeen a person shall not hold out or recommend to the public by any notice or advertisement, or by any written or printed papers or handbills, or by any label or word written or printed, affixed to or delivered with, any packet box, bottle, phial, or other inclosure containing the same any pills, capsules, powders, lozenges, tinctures, potions cordials, electuaries, plasters, unguents, salves, ointments drops, lotions, oils, spirits, medicated herbs and waters chemical and official preparations whatsoever, to be used or applied externally or internally as medicines or medicament for the prevention, cure, or relief of any venereal disease:

"Provided that nothing in this section shall apply to an advertisement, notification, announcement, recommendation or holding out made or published by any local or public authority or made or published with the sanction of the Local Government Board, or in Scotland and Ireland the Local Government Board for Scotland and Ireland respectively or to any publication sent only to duly qualified medical practitioners or to wholesale or retail chemists for the purpose of their business."

11. The public discussion of this subsection, and the various official and unofficial interpretations of it, have stimulated quacks to new and most dangerous development of their business, as will be detailed later on.

12. In July, 1923, the Minister of Health (Mr. Neville Chamberlain) gave the following interpretation:

"I have been to the best fountainhead I could—the Law Officers of the Crown—and I have put to them certain questions as to the exact meaning of the relevant Section of the Act of 1917. I find that their view does not coincide with

that which is so commonly held by chemists, or that which was assumed to be the case by the (Trevethin) Committee. I asked the Law Officers whether anything in the Act prevents a chemist from selling disinfectants for the prevention of venereal disease where no written or printed instructions are affixed to or delivered with the disinfectant. The answer was brief and categorical; it was 'No!' I asked them again whether the second subsection of section 2 permits a chemist to give verbal recommendations of simple preparations intended to be used or applied for the prevention of venereal disease, and the answer was 'Yes! provided that no written or printed paper or label accompanies the verbal recommendation.' . . . Today a chemist may verbally recommend to a customer such preparations for such purposes. What he may not do is to give any written or printed instructions, although he may give verbally such instructions to the customer. . . . I tell you these things today, and I tell them to you with intention. There is no reason why you should not make them known."

Later on Mr. Neville Chamberlain added:

"First of all, it is clear that it would require an alteration in the law to permit the chemist to give printed or written instructions, and *personally I think that if these things are to be sold printed or written instructions should be supplied with them.*"

Still later on Mr. Neville Chamberlain said:

"I feel compelled to make a further observation in consequence of what you have said. I should not like anybody here to be under any misunderstanding. I am quite determined in my own mind that the Ministry of Health shall have nothing whatever to do with prescribing the composition of any remedies that may be made up, or give the instructions. I am going to keep the Ministry of Health quite outside that. Some outside competent authority will have to do that; but it will not be done here."

These statements were made to Deputation of the Society for the Prevention of Venereal Disease, which sought provision for the sale of prophylactic packets in the chemists' shops—with suitable printed instructions for selfdisinfection.

13. The result of this interpretation is that chemists and quacks are now selling at high prices "pills, capsules, powders, lozenges, tinctures, potions, cordials," etc., for the prevention of venereal disease. This nefarious trade is steadily growing under the shadow of the Ministry of Health. The wholesale manufacturers of these goods are claiming that the proviso of subsection 2 of section 2 of The Venereal Disease Act quoted above enables them to send printed advertisements "to wholesale or retail chemists for the purposes of their business," and the retail chemists and druggists and quacks are claiming that Mr. Chamberlain's interpretation enables them to sell, e. g., mercury pills at a guinea a box for the prevention of syphilis, and sandal wood oil capsules at half a guinea a box for the prevention of gonorrhea.

14. It has been found quite possible to exploit the ignorance and gullibility of the English public in this way, partly because of several years of official misleading based on the deliberate and sustained confusion of prevention and cure. The Ministry of Health maintains that cure *is* prevention; and that is all the quacks are doing—selling alleged cures for the prevention of disease. The public is very ready for this kind of misleading because by bitter experience many of them have learned that "cure" is not the simple and easy and rapid affair they have been falsely led to believe. They know that cure at the free clinics has proved to be difficult, prolonged, painful, and sometimes apparently impossible. Thus in desperation they try "swallowing something" when they have risked disease, or fear disease, or know they are suffering from it. They argue that if malaria can be prevented from occurring and recurring by swallowing quinine, why should not syphilis be prevented in the same way. Until the public are taught efficiently—taught collectively and taught individually—not only the mode of infection but also the mode of protection by quick selfdisinfection, they will never distinguish between "prevention" and "cure," and the community will never be saved from the occurrence in perpetuity of fresh cases of disease,—hereditary or congenital as well as acquired.

15. Although prophylactic packets with printed instructions are not on sale in England—but are prohibited, as already explained—such goods as calomel tubes are on sale without accompanying printed instructions. But the chemists do not consider that the few pence profit they make on these justifies them in assuming as a duty of supererogation the giving of free verbal advice to the public; and in any case many of them are not qualified to give reliable instruction in prophylaxis. As a business matter, it is much more profitable for them to accept the new quacks' charter which the Minister of Health has bestowed upon them, and sell more or less worthless remedies at high prices, and give no instructions with these, or just say that swallowing the pills, capsules, etc., so many times a day will "prevent disease."

16. There is reasonable ground for hope that as the sale of these quack medicines becomes more widespread still, in sheer desperation, the Ministry of Health will take its courage in its hands and either end or mend the present dangerous legislation. Then it will be possible to buy prophylactic packets in the London shops, with printed instructions, in the same way as in New York. But unless some competent authority assumes the responsibility for what is to be sold and what is to be said about it, London will still be behind New York, and other American cities where prophylactics are freely on sale, with officially or authoritatively approved printed instructions.

17. The spread of knowledge of selfdisinfection in England is at present almost completely suspended. The Society for the Prevention of Venereal Disease has accomplished very little in this respect and many of its members have become disheartened and retain merely a nominal membership. As a "free lance" I retain all my enthusiasm and earnestness, and all my conviction that in the end truth will prevail; and that the medical profession and the lay public will finally accept the fact that the only way to damp down and stamp out the venereal diseases is to control them in the same way as all other contagious diseases have been controlled and extirpated—namely, by the prevention of new cases—not by the treatment of old ones. The preventive method is being slowly and surely accepted in New York and other American cities. It is still rejected by London and other English cities. America has nothing to gain and everything to lose by paying any attention whatsoever to the misguidance of English officials and their subsidized societies and their morbid or misinformed moralists.

18. The English system has been on trial for nearly ten years, and the results are almost too horrible to contemplate. What England requires, first of all, is a complete revision of her present methods, and this revision cannot take place until there is, first, amendment or abolition of the venereal disease act 1917; second, establishment of a really qualified Royal Commission to consider the management of the whole problem of venereal disease; third, enactment of fresh legislation in accordance with the findings of that Royal Commission. Various official and unofficial "Enquiries" have been held in England during the last few years, but so far they have all proved abortive. No good has resulted from them excepting that gradually to some extent the public has acquired a conviction that all is not well; that venereal disease is being neither prevented nor cured by the present English methods, and that physical and moral deterioration is proceeding—perhaps at an accelerating pace. At any rate, the simple proposition that the way to prevent venereal disease is to *stop it before it begins* has not yet been accepted or realized, publicly or privately, in England; whereas I honestly believe that a little more earnestness, a little more enthusiasm, a little more confidence and publicity in regard to prophylaxis would put the American nation right behind this greatest of all efforts to ensure sexual cleanliness in ourselves and in our descendants.

I may mention, however, as a hopeful portent in England, the fact that the Freethinkers, through their official weekly journal and printing press, have backed up the spread of knowledge in regard to the medical prevention of disease. They have recently published a small book by myself entitled *Sexual Health and Birth Control,* which exposes the ecclesiastical domination of the Ministry of Health, and shows that the extirpation of the noncomformist conscience in England is a necessary preliminary to the extirpation of the venereal microbe.

ETTIE A. ROUT.

Book Reviews

PSEUDOAPPENDICITIS

Pseudoappendicitis. Study of Mechanical Syndromes of the Right Lower Quadrant Simulating Appendicitis. By Thierry de Martel and Edouard Antoine. Authorized Translation from the French, by James A. Evans, A.B., M.D. Preface by R. Bensaude. Illustrated with forty-one engravings. Philadelphia: F. A. Davis Company, 1925. Pp. 211.

At last we have a book that really gets at the bottom of the matter of pain in the right lower quadrant not relieved by appendicectomy. This work is a real contribution because it is based on the study of real cases and is not a hodge podge of active fancy and speculation. It is a pleasure to pay tribute to so thoroughgoing a study by French workers in the face of a tendency in some quarters to speak knowingly of "Gallic exaltation."

The outstanding virtue of this book from the viewpoint of style is clarity. The division of painful syndrome of the right cecocolon is into six groups: 1, Abnormally mobile cecum; 2, perivisceritis of the right lower quadrant with low cecum; 3, ptosis of the entire right colon; 4, Jackson's membrane; 5, perivisceritis of the right upper quadrant; 6, "double barrelled" right colon. Such a classification is exceedingly helpful.

The illustrations are silhouette cuts of radiographs and drawings. The use of the term "ascending cecum" is confusing.

In our opinion the book should be read and well digested by every internist and by every surgeon.

DYSENTERY AND PEPTIC ULCER

Enterogene Entstehung der Magen und Zwölffingerdarm-Geschwüre. Von Prof. Dr. Adolf Posselt. Sammlung zwangloser Abhandlungen aus dem Gebiete der Verdauungs-und Stoffwechsel-Krankheiten, IX Band, Heft 1. Halle a.S.: Carl Marhold, 1924. Pp. 55.

Posselt lays particular stress on the frequency of duodenal and gastric ulcers in patients who at one time or another had suffered from dysentery. Not only the toxic processes existing in dysentery, but also the cachectic state and the various pathogenic bacteria, are probably the cause of the development of the ulcerative lesions in the upper regions of the gastrointestinal tract. Spastic conditions, constitutional individualities, and anomalies of internal secretions are further factors in the origin of peptic ulcers.

THE MELTZER-LYON TEST

Diagnostic et Traitement des Maladies de la Vesicule Bilaire par l'excretion vesiculoire provoquee (epreuves de Meltzer-Lyon et De Stepp). Par M. Chiray et M. Milochevitch. Paris: Masson et Cie, 1924. Pp. 156.

Chiray and Milochevitch have given a complete description of the Meltzer-Lyon test for the diagnosis of gallbladder troubles. After perusing the literature on this topic they come to the conclusion that the dark bile obtained after the instillation of magnesium sulphate into the duodenum is derived from the gallbladder, as Lyon maintains. [This, however, is not yet a settled question. Reviewer.] The authors recommend Lyon's biliary drainage for the following conditions: 1, In chronic or subacute cholecystitis without stones; 2, in the chronic cholecystitis with stones, when these latter are quiescent, and there is a catarrhal inflammation of the biliary passage; 3, in acute cholecystitis complicating typhoid fever; 4, in atony of the gallbladder with spasm of the ampulla of Vater in duodenal ulcer; 5, in catarrhal obstruction of the cystic duct; 6, in all cases of chronic cholecystitis due to calculi, in which operations are contraindicated (like diabetes, severe heart lesions, nephritis, etc.). The book is well written.

SELFTREATMENT OF DYSPEPSIA

Dyspepsia and Its Selftreatment. By Jabu Nath Ganguli, B.A., M.B., Benares: M. B. Nath, 1924. Pp. 218.

This monograph instructs in a popular way the dyspeptic how to proceed. Acute conditions should be handled by the physician. Chronic cases, however, have to be taken in hand by the patient himself. "Be methodical and punctual in carrying out the instructions given. Method is orderly arrangement of things and works, and punctuality, its twin brother, is exactness in time. If you frame out a method of serving your body, and be punctual in ministering to its daily wants, recovery follows as certainly as day follows night." Ganguli takes much stock in fasting. He says, "Fasting is out and out the best physician in most stages of the disease, if judiciously resorted to." A fast at intervals and in length of time suited to the condition of the patient, is often successful in effecting a cure. On the contrary, indiscreet eating and drinking are like two thieves that come to the patient in the garb of friends to steal his health. Eat to live, but do not live to eat. Ganguli is also an advocate of prayers, and believes that praying to God helps to produce a cure.

RELATION OF LIVER TO ABDOMINAL INFECTION

The Liver and Its Relation to Chronic Abdominal Infection. By Charles Gordon Heyd, B.A.M.D., and John A. Killian, M.A., Ph.D. Structural Changes in the Appendix, Gallbladder and Liver from the Same Patient. By Ward J. MacNeal, Ph.D., M.D. Beaumont Foundation, Annual Lecture Course III, 1924. St. Louis: The C. V. Mosby Company, 1924. Pp. 165.

This little book, the joint product of the surgeon (clinician), biochemist and pathologist, is a good example of team work in medicine.

For the past few years Heyd has been removing bits of liver tissue from his laparotomized patients, particularly those suffering from gallbladder disease. He has thus learned that instead of being a pathological rarity, some form of hepatitis exists in all cases of chronic abdominal infection. Gallbladder trouble may therefore be regarded as an end stage, rather than an independent occurrence in a long series of changes involving the entire portal circulation. This lesson is well read and it should teach us that it is only by taking care of the organs draining into the portal circuit that we can prevent liver drainage and ultimate gallbladder localization. In this preventive program the surgeon plays a rôle, but by no means the entire rôle, inasmuch as the whole field of gastrointestinal hygiene and prophylaxis is opened up in this connection.

DIETETICS

Diet in Health and Disease. By Julius Friedenwald, M.D., and John Rühran, M.D. Sixth Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders Company, 1925. Pp. 987.

This standard book on dietetics is now in its sixth edition. Among the new matters included are sections on food poisoning, carotinemia, anaphylaxis, feeding of infants and children, celiac disease, diseases of the stomach and intestines, high blood pressure, nephritis, arthritis, postoperative diets, diabetes, deficiency disease. There have been revisions or additions to the tables of the salt contents of foods and weight, height and age. Professor McGlone has revised the section on the physiology of digestion and Dr. Gichner that on diabetes.

Locke's tables showing the composition of foods as actually eaten are included and are sure to enhance the book's value. There are still other additions, which together with those enumerated justify the statement in the preface that this single volume brings together "the greatest possible number of facts relating to food and nutrition in health and disease."

DISEASES OF THE RECTUM

Diseases of the Rectum and Pelvic Colon. By Martin L. Bodkin, M.D., F.A.C.S. Illustrated. Second edition, revised and enlarged. New York: E. B. Treat and Company, 1925. Pp. 487.

There are numerous good ideas scattered throughout this work, but on the whole the presentation is unfortunately inadequate. The English is not good, the style is careless and suffers heavily from lack of clearness. The discussion of colon irrigations and of constipation is unsatisfactory. The writer speaks of "the value of the rectum as a means of supporting life," and dismisses the subject of spastic constipation in a few colorless sentences. Neither in the section on examination of the feces nor in that on intestinal flora is the principle of the Schmidt intestinal diet even once mentioned.

As an evidence of carelessness in the getup of the book, it may be mentioned that one of the röntgen illustrations is printed upside down. It must be admitted that there are better books on diseases of the rectum and the pelvic colon.

HYGIENE

Grundzüge der Hygiene für Mediziner, Pharmazeuten und Ärzte. Von Dr. med. et phil. Max Eugling, Privatdozent für Hygiene an der Universität in Wien. Mit 131 Abbildungen. Berlin, Wien: Urban & Schwarzenberg, 1925. Pp. xvi-384.

This outline of the basic principles of hygiene is primarily intended for medical students, pharmacists, and physicians, but the style of presentation is so simple and the language so plain that it may well be recommended even to the laity.

The usual subjects discussed in textbooks on hygiene are discussed, such as the chemical composition of air, its gaseous contaminations, the foul air of close rooms, the dustlike elements in the air, moisture, air pressure and winds. Another chapter deals with the various kinds of climate. The heat economy of man is explained. Clothing and baths are discussed. The water supply is discussed and the cleansing and methods of sterilization of water are described. The various forms of food and their conservation are fully described. Special chapters are devoted to the hygiene of buildings and apartments, their heating, ventilation and illumination (natural and artificial). The disposal of waste matter is discussed. A chapter is devoted to the construction of special structures, such as hospitals, prisons, mass quarters and school buildings. The chapter on microorganisms and the methods used in their study are very precise. The chapters on infection and immunity and the subject of disinfection are well presented. There are also chapters on epidemics and their prevention. The chapter on the special microorganisms and infectious diseases is short and to the point.

The chapters on social hygiene and social welfare, on occupational hygiene, and on racial hygiene are all very practical and up to date. The book is extremely practical, and will be of special interest to the beginner in the study of hygiene.

INFLAMMATIONS OF LIVER

Les Hépatites Dysenteriques et leur Traitement. Par A. Valassopoulo et Pavlos Petridis. Preface du Dr. E. Rist. Paris: Masson et Cie, 1924. Pp. 143.

This excellent monograph deals with various forms of inflammations of the liver after dysentery, and also abscess formations in this organ as they are frequently encountered in the tropical countries, especially in Egypt. Valassopoulo and Petridis are great advocates of Roger's emetine treatment, as soon as a liver affection manifests itself in conjunction with amebic dysentery. The diagnosis of liver abscess is, at times, extremely difficult. Even an exploratory incision or puncture may fail to reveal pus, and still a small abscess be present. The authors advocate a thorough exploration of the liver and pleura by the Petridis method and thorough draining of the abscess.

The prognosis of liver abscess is grave, even after operation. Rupture of the abscess into the lungs, pleura, pericardium, gastrointestinal pericardium, gastrointestinal tract, and peritoneum are reported. In a few of these cases there was recovery.

ROOSEVELT HOSPITAL

Medical and Surgical Report of The Roosevelt Hospital, New York. Second Series, 1925, Based on the Work of the Years 1915-1924 Inclusive. New York: Paul B. Hoeber, Inc., 1925. Pp. xvii-378.

This report contains articles written by members of the hospital visiting staff expressly for this purpose, and also reprints of papers published in recent years in various medical and surgical journals. Twenty-two contributors are the authors of thirty-four articles, covering many fields of medical and surgical endeavor. The illustrations are quite numerous and well executed. The print is easily read. It is an excellent example of book making and the publishers are to be congratulated.

This book compares very favorably, from the medical and surgical viewpoint, with the other publications from certain clinics, which are deservedly very popular. This type of publication has this advantage over the more formal textbooks that they are intensely practical and usually more up to date. There was a time when such reports were published gratis. Now, that they are to be had only by purchase, they will probably be estimated according to their true worth.

THERAPEUTIC ANNUAL

L'Année Thérapeutique. Par L. Cheinisse. Anné 1924. Paris: Masson et Cie, 1925. Pp. 186.

This is the fifth yearly volume issued by the author as a summary of the therapeutic gleanings of the preceding year. While by no means an extensive work, it may be said to cover satisfactorily most of the new procedures which the general practitioner would have occasion to apply. A considerable number of the therapeutic measures recently advocated by American observers are included, for instance, insulin in preoperative and postoperative acidosis, benzyl benzoate in angina pectoris, convalescent serum in erysipelas, active immunization and serum therapy in scarlet fever, Coleman's diet in peptic ulcer, exsanguination transfusion in burns, etc. In addition, the reader familiar with French will obtain from the book a large number of other therapeutic suggestions, all acceptably presented and intelligently discussed. Among them are vaccine therapy in chancroid, milk injections in whooping cough, stovarsol in amebiasis, sodium borate in nervous dyspepsia, intraspinal casein injections in epidemic encephalitis, and sodium thiosulphate injections in gonorrheal epididymitis. These examples will suffice to show that the book is of the highest practical utility to the physician looking for some new procedures with which to oppose the commoner morbid states.

JAPANESE MEDICAL STUDIES

Mittcilungen aus der Medizinischen Fakultät der Kaiserlichen Universität zu Tokyo. Tokyo: Verlag der Kaiserlichen Universität, 1924.

Band XXXII, Heft 1, contains an article by T. Hayashi on experimental studies on the relationship between nephritis acidosis and the phosphorus and urea content of the blood. C. Aibara contributes an article on the effect of adrenalin on the blood picture of the rabbit and man, especially its value in the functional testing of the spleen. K. Sakaguchi, T. Matsuyama and M. Nakayama write about the determination of the excretory threshold of sugar. Sakaguchi, Gyötoku and Matsuyama discuss the variations in the excretory threshold of sugar. S. Yosida discusses the pharmacology of cobalt.

Band XXXII, Heft 2, contains an article by S. Idzymi on the biochemical and serological studies on hatched chicken eggs. M. Nakamura discusses the hemolysins in the colostrum of women. K. Takagi discusses the significance and the measurement of the röntgenologic shadow of the sella turcica and the shadows appearing in its vicinity. T. Sannai writes about dermoid cysts of the ovary.

Band XXXI, Heft 2, includes studies on neurotoxins by M. Ohta, an article on orthotic albuminuria by H. Hyeda, and the report of a case of myeloid chloroleucemia by Y. Harada and J. Nagai.

In Band XXXI, Heft 3, Y. Harada discusses the effective mechanism of adrenalin and the fate of the same in the organism. K. Mabuchi contributes some morphological studies on the behavior of the nerves in the female sexual organs of man with special consideration of the changes in their behavior during pregnancy and menstruation and in advancing age; an appendix refers to the nerves in the umbilical cord and placenta.

THE VICIOUS CIRCLE

God's Stepchildren. By Sarah G. Millin. New York: Boni and Liveright, 1925.

Nature has its cycles, slow moving but inevitable, and by the aid of this book one realizes a little more keenly perhaps that human living is but a part of nature, under the same cyclic bondage.

What the Rev. Andrew Flood was in in his mission to Darkest Africa is bound up in what his children's children become—the mixed breed sprung from him pursues its rise and fall slowly and surely like the seasons.

The Rev. Andrew Flood goes into the wilderness armed with a dream. Despite the cloth it is a selfish dream. It is that he shall bring the brown brethren to Christianity, thereby winning success, esteem for himself. He cannot conceive of his own unimportance in the scheme of things. And when the girl whom he honors with an offer of marriage rejects him, he quite literally turns his back on the world and sulks. Vistas of the easiest way open constantly before him, each made palatable by the thought that thus he, *he* will be nearer to his people, better able to help them, more looked up to by them.

He marries a native woman and has two half breed children. The daughter, so nearly white, is taught by a nearby minister until she mates with a Kleinhans. Their son, again so nearly white must *be* white. That is her dream and it shatters soon upon the rocks of reality. He marries a halfcaste and their daughter is white—almost. There follow his rise, her marriage, her child, her downfall. And the present generation is represented by a white clergyman. He marries an English girl with his mixed ancestry a secret from her. Their child—the mysteries of heredity remain unelucidated. But at last in this great, great grandson of Andrew Flood the native flair for reality breaks through. He throws aside the dream the generations have heaped upon him. He turns to the only thing that he can do, the completion of his forbear's task. The cycle is ended —where it began. Only thus can the unproductivity of the first man's life be rectified through knowledge —through unselfish service.

The author has given us a stifling human document. We feel that she has caught the pulse of living, that she has brought a different, more helpful understanding to a sociological problem than anyone else. She tells you about real people without romancing, without glory—each generation simply making the best of its blind course from birth to death.

Medicoliterary Notes.

A recent statistical report states that the Jewish farm population has increased from two hundred families to seventy-five thousand persons in the past quarter century.

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The U. S. Bureau of Labor Statistics has added to its *Wages and Hours of Labor Series* bulletins on the subject as applied to the hosiery and underwear industry, 1907-1924; the paper and pulp industry, 1924; and in cotton, woolen and worsted goods manufacturing, 1924.

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Among recent genealogical publications is a work entitled *The Descendants of Dr. James Hunter*, who came to Canada in 1822 from Yorkshire, England. Most of his descendants live now in the United States. Among the early

members were the well known English surgeon, Dr. John Hunter, and his brother, Dr. William Hunter. Frederick H. Hitchcock is the publisher. Another work of interest to the medical profession issued by the same publisher is the book entitled *Specialized Courts Dealing with Sex Delinquency;* a Study of the Procedure in Chicago, Boston, Philadelphia and New York, by George E. Worthington and Ruth Topping.

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The milkman in Nome, Alaska, does not need to worry about spilling his milk. He calls from house to house and delivers a block of frozen reindeer milk or cream equal to a pint or a quart. A white cord frozen into the block of milk serves as a handle to facilitate delivering. The blocks of milk or cream are tastily wrapped in oiled paper looking for all the world like icecream.—*American Journal of Public Health.*

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During 1924 it is estimated that 2,536 physicians died in the United States. Based on the estimate of 145,966 physicians in the United States, this is equivalent to an annual death rate of 17.37 as compared with 17.95 for 1923 and 16.94, the average for the last twenty-three years. The age of death of the 2,448 whose age was stated varied from twenty-two to ninety-nine years, the largest number of deaths at any given age occurring at sixty-five years. Of the 2,433 deaths for which causes were given, diseases of the circulatory system accounted for 893, the largest number. Diseases of the respiratory system caused 248 deaths, and of these 219 were due to pneumonia. Diseases of the genitourinary system caused 165 deaths, diseases of the digestive system 130, and diseases of the nervous system sixty-two. There were 102 deaths due to accidents, of which fifty-five were automobile accidents. Forty-five physicians ended their lives by suicide.—*Journal of the American Medical Association.*

* * *

Readers of the works of James Branch Cabell will be interested to know that in the book about Cabell by Carl Van Doren, recently published by McBride, is a map of that land of romance and mystery, Poictesme. Locations are shown of the places where many of the noble, and base, deeds of the Dom Manuel cycle were performed, including such thrilling spots as Storisende and Amneran Heath.

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The issue for February of the *World's Health*, the monthly review of the League of Red Cross Societies published in Paris, contains two especially interesting biographical articles, one a sketch of the life and work of Gustave Moynier, who did more than perhaps any other one individual to establish the whole organization of the Red Cross; and the other an obituary notice of Professor Bergonié who died on January 2, 1925, a victim to his life work, the study of the x rays.

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Professor Emory Holloway of Adelphi College has stated that a statue of Walt Whitman should be placed, most suitably, on the Battery overlooking Brooklyn ferry which he so greatly loved and celebrated in his poems. Professor Holloway feels that for the approaching foreigner to see the paternal hand of Whitman outstretched in welcome to the new world would make him feel much more at home than to view far above him the statue of Liberty, remote and perhaps a little supercilious.

* * *

How to Live, the bulletin of the Life Extension Institute for August, 1924, contains some interesting and alarming figures on automobile fatalities. In 1921 some of the causes of deaths in the registration area were as follows: influenza, 10,193; typhoid fever, 8,007; angina pectoris, 8,031; cirrhosis of the liver, 6,598; alcoholism, 1,611; *automobile accidents*, 10,168. This means that the automobile is more fatal than the typhoid bacillus, and kills many more people than does alcohol directly. The increase in the death rate from this source is even more alarming. In 1910-11 the death rate in 100,000 was 1.0; in 1911-15 it was 3.9; in 1916, 7.3; in 1917, 9; in 1918, 9.3; in 1919, 9.4; in 1920, 10.4; in 1921, 11.5; and in 1922, 12.5. The last figures show a rate twelve times that of 1900. The majority of accidents are attributed to carelessness, stupidity, self indulgence, and in some degree, to an exaggerated sense of self-importance on the part of many people. There are, the report states, only three good reasons for speeding—fire, accident, and illness.

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The issue for May 31st of *Books*, the literary review of the New York *Herald-Tribune*, contains an unusually large number of interesting book reviews. Among the works reviewed are the *Life of Sir William Osler*, by Dr. Harvey Cushing, most ably reviewed by Stuart Pratt Sherman; *The Origin and Evolution of Religion*, by Dr. Albert Churchward, reviewed by Herbert W. Schneider, of the department of philosophy of Columbia University; and *Child Marriages*, by Mary E. Richmond and Fred S. Hall, reviewed by Winthrop D. Lane.

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An international congress of all workers in the field of plant sciences is announced by the Botanical Society of America to be held at Ithaca, N. Y., August 16-23, 1926. The discussions will include the various branches of botanical science and its applications to the fields of bacteriology, agriculture and forestry.

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Probably only a few of those who for many years have enjoyed the incomparable mystery and adventure stories of the late Rider Haggard know that, in addition to being a prolific writer, he was also greatly interested in social problems, particularly those of rural life in England. In 1901-02 he made an extensive survey of agricultural conditions in Great Britain, and was also a zealous worker in the social service activities of the Salvation Army. In 1912, he was knighted and among the services contributing to the receipt of this honor was the work he did as chairman of the Reclamation and Unemployed Labor Committee of the Royal Commission on Coast Erosion and Afforestation. He then traveled around the world as a member of the Dominions Royal Commission, and wrote four tales while he was voyaging. In 1917 he was made a member of the Empire Settlement Committee, and during and after the war worked unceasingly and zealously on the problems connected with emigration.

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Cook County, Illinois, has authorized the formation of a county public health unit to take care of communities too small to have their own health service.

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The University of California Press has recently published a bibliography of eugenics, including ten thousand titles, compiled by Samuel J. Holmes, professor of zoology at that institution.

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The National Child Welfare Association has undertaken the organization of the "Knighthood of Youth" for young boys as a measure to combat crime. A "daily dozen for character building" is a part of the four years' course of education in knighthood; honors representing the degrees of knighthood are to be given for high standing in the work and duties of the organization. Tournaments and ceremonies for knighting are a part of the program.

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The bells of Carlisle Cathedral, England, which have not sounded since Prince Edward Charles Stuart crossed the border with his Highlanders 180 years ago, are to sound again. They have been entrusted to a bell founder to be cleaned, tuned and refitted. After the entrance of the Stuart prince into Carlisle in 1745, the bells were sentenced to one hundred years of silence. By the expiration of the period they were in such a state of repair as to make ringing impossible. The oldest of the bells was cast in 1410.—*New York Evening Post.*

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Figures compiled by the Science Service show that $2.48 worth of soap is used annually by the average American.

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The Library of Columbia University has recently added the millionth book to its shelves.

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Scented decoys for the deadly tsetse fly are now employed in upcountry districts by government entomologists. In order to trap and destroy the insects dummy animals are erected upon which the flies light and linger until they can be killed.—*Science.*

Abstracts from Current Literature

GASTROENTEROLOGY

Clinical Significance of Diverticula of the Duodenum.—Martin Haudek (*Wiener klinische Wochenschrift,* August 7, 1924) reports a case, in which a duodenal diverticulum in association with stasis in the stomach and duodenum gave a disease picture resembling ileus and resulted in death, lending support to the view that is frequently expressed in the literature, that duodenal diverticula may give rise to all sorts of dangers to the patient. On the other hand, the surgical removal of the diverticulum may cause many difficulties because the finding of the diverticula is not always possible. There is no clinical disease picture that is characteristic of duodenal diverticulum. Up to the present time it has never been possible to relieve the abdominal symptom complex by extirpation of the diverticulum, which occasioned the operation. Our previous experiences regarding the pathognomonic dignity of the duodenal diverticulum which occurs in three per cent. of all adults, are by no means sufficient.

Nonperforating Ulcers of the Stomach and Duodenum.—J. Emmons Briggs (*Boston Medical and Surgical Journal,* December 11, 1924) enunciates the following conclusions:

Carious and defective teeth are probably responsible for infections of the alimentary tract, gastric and duodenal ulcer, cholecystitis and appendicitis; hence the frequent association of these diseases. The most constant symptoms of ulcer are in the order mentioned: epigastric pain, loss of weight, vomiting, pyrosis, hemorrhage. History and x ray are the most important factors in diagnosis. Duodenal ulcers are twice as frequent as gastric ulcers. Gastroenterostomy with excision of ulcer is the ideal operation for gastric ulcer. Destruction of the duodenal ulcer (with gastroenterostomy) is desirable in order to assure a radical cure, and should always be done if bleeding has occurred. Massive hemorrhage should be treated medically until hemorrhage ceases and patient recuperates sufficiently to permit of resection of ulcer. Desperate cases of starvation from stenosis should be treated by preliminary jejunostomy. Acute ulcer should be treated medically: chronic indurating ulcer, surgically. Early postoperative vomiting signifies dilatation of the stomach, which should be treated by gastric lavage. Protracted postoperative vomiting, not relieved by gastric lavage, demands prompt surgical intervention and the most frequent cause is intestinal obstruction. Intestinal adhesions from previous operations may seriously complicate an otherwise well indicated gastroenterostomy for gastric or duodenal ulcer. No operations for ulcer should be made without inspection of gallbladder and appendix and, if diseased, these organs should be removed, if compatible with safety. A systematic followup system is the only way to obtain accurate knowledge concerning end results.

Attenuated Form of Pancreatitis.—Pierre Delbet (*Bulletin de l'Académie de médecine,* May 27, 1924) maintains that this is a rather common condition, which may be readily recognized on the basis of a certain symptom group, comprising chiefly pain and abnormal pulsations in the epigastrium. The pain is often diffuse and imperfectly localized by the patient. It may extend to the right or left of the midline. Pressure increases it, and sometimes compression of the lumbar fossa elicits more distress than that of the epigastrium. In the mildest cases the pain is relatively light, but the patients are nevertheless anxious to be relieved of it, and are sometimes looked upon as psychopaths. Where the pain is more pronounced, it increases toward the end of gastric digestion and is attended with a feeling of fulness and puffiness. Sometimes there are added attacks of severe pain suggesting hepatic colic or gastric ulcer. These patients are easy to examine, as there is little or no rigidity. No mass is felt, but the pulsations of the aorta are at once perceived. In their subjects the abdominal wall is pushed up at each systole. The pulsations are seen transversally over a distance much greater than the diameter of the vessel. Often there is anorexia, slight loss of weight, and digestive disturbances presenting no special characteristics. The pulsations are not expansive, and are therefore not due to aneurysm. Their abnormal extent is ascribed to the presence of thickened, indurated tissues between the vessel and the parietes. That the pancreas is the organ concerned is believed shown by a case in which the symptoms already described were followed, after a time, by a more rapid progress of the disease, with jaundice and the appearance of a large mass between the ensiform and the umbilicus, elevated by the aortic pulsations. Operation revealed a pseudocyst of the pancreas, and as soon as the pressure was relieved the jaundice disappeared. Attenuated forms of pancreatitis may either be completely recovered from, lead to fibrosis of the pancreas with pressure on the biliary tract, or result eventually in a pseudocyst of the pancreas. The cause of attenuated pancreatitis appears to be the same as in the typical acute pancreatitis.

Duodenectomy.—C. A. Pannett (*British Journal of Surgery,* October, 1924) offers a small series of cases in which the mortality rate was low, with a view to popularizing the operation of duodenectomy employed throughout his series. He gives the operative technic in full, emphasizing in particular two pathological facts which assume great prominence in duodenectomy, namely, the tendency to widespread fibrosis in the neighborhood of the ulcer, and the frequency with which two ulcers are present. The first phenomenon is so important because of the nearness of the common bile and pancreatic ducts and their liability to injury unless great care be taken, for they early become surrounded by fibrous tissue which has invaded the gastrohepatic ligament and pancreas. In the case of the stomach it is easy to control the blood supply before resecting, by ligature of the main vascular trunks. But this is not possible in the case of the duodenum, because the pancreaticoduodenal artery conveys blood, not only to the duodenum itself, but to the head of the pancreas. It is therefore necessary to ligate the numerous small branches which come off from the vessel and enter the pancreatic wall of the duodenum. This is a tedious and timeconsuming procedure, but it must be done with meticulous care, since the obscuration of the area of operation by blood may lead to serious consequences from loss of the power of orientation. There are indeed two main guiding principles in duodenal resection: to keep the dissection close to the wall of the viscus, so that damage to the bile or pancreatic ducts may be avoided; to control the blood supply by tying the small terminal branches separately.

Cholecystogastrostomy and Cholecystoduodenostomy.—F. G. DuBose (*Surgery, Gynecology and Obstetrics,* September, 1924) complains of the unsatisfactory end result in gallbladder surgery and offers the following indications and contraindications for cholecystenterostomy as the operation of choice.

Contraindications.—1, cancer or other gallbladder neoplasms; 2, gangrenous cholecystitis; 3, atrophic or contracted gallbladder, and 4, cystic duct occlusion or obstruction other than stone.

Indications.—1. Common duct obstruction in patients who are poor surgical risks from extreme illness, complications or associated physical diseases. When safety first is regarded, cholecystenterostomy is the best remedial measure available. 2. Residual hepatic duct stones when secondary common duct obstruction is a probability. In these cases cholecystectomy is contraindicated, and also cholecystostomy because a continuous and perhaps complete external flow of bile may result. 3. Chronic or intermittent jaundice of obscure origin; or jaundice secondary to inoperable disease of the liver, pancreas, or duodenum, causing obstruction to the common duct. 4. Perforation of the gallbladder. Cholecystenterostomy is safer than cholecystectomy and gives a more rapid convalescence than cholecystostomy. 5. External drainage consequent to operations on the upper abdomen after the removal of gall stones. Anastomosis is safer and simpler. 6. Perforation of a pyloric or duodenal ulcer. The chance is lessened of constricting the lumen and promoting healing of the ulcer area by bathing it continuously with the alkaline bile. 7. Persistent pyloric spasm from hyperacidity unrelieved by medical treatment. 8. Acute pancreatitis. Cholecystenterostomy permits of free drainage of bile, yet conserves it for the patient's use, and is to be preferred to either cholecystostomy or cholecystectomy.

Therapeutic Enterostomy.—M. F. Porter (*Annals of Surgery,* October, 1924) believes that enterostomy in an obstructed loop of intestine prior to removing the cause of obstruction will frequently aid in determining whether or not excision is necessary, will lessen the danger of fatal toxemia following relief of obstruction, and make the relief of the obstruction easier, whether or not there is strangulation. Many of the deaths following operation for bowel obstruction might be prevented by opening and draining the obstructed bowel of its contents before the obstruction is removed. The danger from soiling the wound may be avoided in large measure and is not as great as is the danger from absorption of long obstructed bowel content. The danger and inconvenience of enterostomy have been exaggerated; while the benefits to be derived therefrom have been underestimated and a correct valuation with consequent modification in surgical procedure would be beneficial.

Rupture of Intestine with Strangulated Hernia.—F. LeM. Hupp (*Annals of Surgery,* October, 1924) points out that in dealing with a strangulated hernia, with death of the bowel, there are at least two mortality factors to be considered in addition to the shock occasioned by the intestinal block:

First, the possibility of an intraabdominal leak, due to a partial or a complete rupture at the point of the constriction from pressure necrosis.

Second, there may be further added a definite pathological entity in the form of an ulceration of the gut, leading to a postoperative perforation. That this accident has been recorded with increasing frequency, and this fact should lead to a searching interrogation of the mucous membrane immediately adjacent to or beyond the line of anastomosis, in order to forestall a potential leakage.

Experimental Pancreatectomy.—Hédon (*Presse médicale,* March 7, 1925) relates that a completely pancreatectomized dog was kept in excellent health and at normal weight for fourteen months by means of two daily injections of insulin, which checked his diabetic tendency, and ingestion of pancreatic ferments, which controlled his digestive disturbances. All functions remained normal, including the sexual function. Complete interruption of the insulin treatment brought on intense glycosuria and the appearance, on the sixth day, of evidences of grave acidosis. In addition to sugar, the urine showed albumin, hemoglobin, bile pigments, casts and fat. Resumption of insulin overcame the glycosuria, but in no wise improved the general condition. On the seventh day, in profound coma, the animal was moribund, his alkali reserve having fallen to eleven in 100. Three intravenous injections of sodium bicarbonate, totalling five grams, revived him in a marvelous manner. On the next day, he was strikingly improved, and large amounts of insulin and carbohydrates completed his restoration in a few days. Prolonged administration of insulin in this animal is not thought to have exerted the least toxic effect on the internal organs, otherwise prompt and perfect recovery from so serious a condition could not have occurred.

Improved Technic for Intestinal Anastomosis.—C. A. Roeder (*Annals of Surgery,* December, 1924) offers an operative technic whose desirable features are its ease and rapidity of application, its relatively high degree of asepsis and its resulting large lumen, due to a very narrow rim of intestinal tissue remaining within. The intestine is crushed three to four eighths of an inch wide, on an angle of about fifty degrees. A long narrow bladed clamp is applied in the crushed area adjacent to the segment to be resected and another similar clamp placed closely parallel with it; which leaves, for a later step, fully one fourth of an inch of crushed intestine proximal to the remaining clamp. The intestine is then amputated with a cautery, and the clamps remaining on the segments to be united are brought closely together. One continuous mattress suture of fine linen is then passed through both segments, along the edge of the crushed tissue, where it adjoins the normal intestine. This linen approximating suture becomes slightly contaminated as it passes through the crushed intestine, but is easily sterilized with a swab of pure phenol. This is the only step of any danger and can be safeguarded by simple isolation with packs, and the use of phenol on the suture. We now have the ends of the segments to be anastomosed closely approximated by the single temporary linen suture held taut between two forceps; and distal to the suture we have superfluous crushed tissue which is again amputated with a cautery to within about an eighth of an inch from the linen suture line. This leaves a rim of crushed intestine only one eighth of an inch wide, which is inverted by a single layer of Lembert anastomosing suture of fine silk. The anastomosing suture, using the linen approximating suture as a pivot, must be very accurately and uniformly passed entirely around the approximated segments and through the very edge of the uncrushed intestine. I have found that if the suture is started on the side opposite to the approximated crushed edges, the procedure is greatly facilitated. After the anastomosis has been completed the temporary linen suture is cut and pulled through, leaving the crushed edges still obstructing the joined segments. The index finger and thumb then invert the intestinal walls through the rim of the Lembert suture, opening the anastomosis, which will be found to have a lumen amply sufficient. Soft clamps are occasionally applied on the intestine about three inches away from the resected ends in order to retain intestinal contents; however, this is generally unnecessary. The small intestine is frequently anastomosed, end to end, to the large intestine, and I have found that by increasing the length of the crushed area in the small intestine, the operation can be carried out in the same manner as above. Again in this operation the main point in technic is the suturing which must be planned to invert as little intestinal tissue as possible.

A Statistical Study of Eight Hundred and Eighty-Eight Cases of Biliary Tract Disease.—Alfred Blalock (*Bulletin of the Johns Hopkins Hospital,* December, 1924) divided the cases into two groups, depending on the presence or absence of stones, and their position when present. This interesting and somewhat lengthy statistical study includes a consideration of the etiology, symptoms, physical findings, laboratory findings, operations and reoperations, bacteriological and pathological findings, and the course immediately after operation, and ultimate results. A few of the more important points brought out in the cases of disease of the biliary tract treated surgically are the following: The average age was forty-four, the highest incidence being in the fifth decade. The most common symptom was pain. Jaundice was present in thirty-nine per cent. of all cases, the highest percentage being in the group with stones in the common duct. The leucocyte counts were surprisingly low, in few cases over 15,000. X ray studies showed stones in thirteen per cent. of the cases in which plates were made. Fifty-eight per cent. of all cultures taken at operation were positive, the predominating organism being Bacillus coli, and Bacillus typhosus ranking next. The stay in the hospital was usually shorter and less disagreeable after cholecystectomy than after drainage of the gallbladder. The percentage of cured and improved patients following cholecystectomy and cholecystostomy was about the same but only thirty-nine per cent. of the deaths followed cholecystectomy, and sixty-one per cent. followed drainage of the gallbladder. The facts presented lead the authors to conclude that the gallbladder should be removed in all cases in which it is disease, whether stones are or are not present, except in cases with malignancy of the biliary tract, provided that the condition of the patient is such that the added time under anesthesia will not lessen too greatly his chances for recovery. In malignancy of the gallbladder, when a positive diagnosis can be made without exploration, no operation should be performed, inasmuch as it only shortens the patient's life.

Studies on the Total Bile.—Douglas R. Drury (*Journal of Experimental Medicine,* December, 1924) investigated conditions influencing the calcium content of the bile, making a day to day study of the calcium content of the total liver bile of dogs intubated under sterile conditions. The concentration of calcium in the bile was found to be fairly constant under physiological conditions not involving wide fluctuations in the secretory output. The calcium yield for each twenty-four hour period varies in general directly with the amount of bile. When this amount becomes greatly lessened, as the result of fasting, the concentration of calcium becomes markedly increased, though not sufficiently so to compensate for the lessened volume. When the bile is much above the average, after the ingestion of food in quantity, the calcium content, unlike that of pigment, does not become correspondingly diminished, but tends to remain the same as usual. So when great amounts of bile are put out,

so too are relatively great amounts of calcium. This is not caused by the increased ingestion of the element, for neither feedings with bone meal, nor the administration of large quantities of calcium salts intravenously or by mouth have any effect on the biliary output of calcium. The normal gallbladder, far from secreting calcium into the bile, as some have thought, acts to remove this element from the secretion, and removes carbon dioxide as well. The "white bile," which is a specific secretion of the bile ducts, contains but little calcium, like the mucous secretions from elsewhere in the body. The concentration is only slightly greater than that in the blood plasma, and contrasts significantly with the high concentration to be noted in true bile of the fasting animal. Evidently the greater portion of the bile calcium must be secreted, not by the duct walls, but by the liver itself. The findings have an evident bearing on the problem of cholelithiasis.

Jaundice.—J. W. McNee (*British Medical Journal,* September 20, 1924) states that the most recent theory of jaundice is based upon the claim that the cells of the reticuloendothelial system, particularly of the spleen, which elaborate the bile pigment, and that the polygonal cells of the liver, are mainly concerned with its passage into the bile. The direct and indirect Van den Bergh reactions serve to explain the two varieties of bilirubin and it is possible that the bilirubin in passing through the glandular liver cells is modified in some way. The following classification of jaundice is proposed: Obstructive hepatic jaundice, toxic and infective hepatic jaundice, and hemolytic jaundice, which include all the clinical varieties of jaundice. Some of the clinical types may have to be placed in two of these divisions.

Leucocyte Counts in Acute Appendicitis.—W. C. Menninger and H. S. Heim (*Annals of Surgery,* December, 1924) present a detailed study of the relationship between the total leucocyte count and the percentage of polymorphonuclear leucocytes, with special reference to the effect upon this relationship of sex, age, temperature, pathological process and infecting organism. They find that the total leucocyte count is a measure of body resistance against an inflammatory process up to a certain degree of leucocytosis; the percentage of polymorphonuclears is an index of the severity of the inflammatory process; and that the greatest aid to be obtained from a preoperative blood count as to indication for operation, is the relationship of these two, as described in this article. Females show a slightly better resistance than males, but the difference is so slight, that we do not give it weight. The younger the patient, the better is his resistance. This fact, which is generally regarded as an axiom, is here supported by actual findings, and has been found to hold for all ages. The temperature, as shown in a series of cases, is proportional to the polynucleosis and to the resistance index, although it shows slight variation under 101°. The best resistance is offered by the individual against the less severe pathological process. With an extensive process, the body resistance is overwhelmed. The type of organism very probably plays a rôle in the severity of the inflammatory process and consequently in the resistance index, but because of varying degrees of virulence of different strains of the same organism, definite conclusions can not be drawn from the data here presented.

Primary Carcinoma of the Appendix.—Howard A. McCordock (*Buffalo General Hospital Bulletin,* July, 1924) reports three cases of socalled carcinoma of the appendix. Two of these cases were typical carcinoids while the third case was apparently a double carcinoma, a carcinoid and a gelatinous (colloid) carcinoma, the former involving the distal, the latter the proximal part of the appendix where a rupture occurred leading to escape of gelatinous material (pseudomucin) into the peritoneal cavity. In the literature the vast majority of reported cases of primary carcinoma of the appendix belong to the carcinoid type and only one of these is known to have developed malignant qualities. The rest of the reported malignant primary carcinomas of the appendix were probably such as might occur in any part of the intestinal tract. Some observers regard the carcinoid type of tumor as a carcinoma with a limited degree of malignancy, while others as tissue malformations. A socalled mucocele of the appendix, studied in conjunction with the author's gelatinous carcinoma, appeared to resemble the latter in structure, and the question is raised whether many of the reported mucoceles were not really similar tumors. The author's gelatinous carcinoma developed from the carcinoid although the morphological proof of transition from one into the other is not very strong. Assuming the solid carcinoid to be a tissue malformation with glandular potency, it may by progressive growth and development be converted into a glandular tumor and finally be subject to mucoid degeneration yielding the type of growth known as gelatinous carcinoma. Such metamorphoses would not necessarily lend the growth any malignant characters, which would be in harmony with the lack of malignancy of many of the reported cases of glandular carcinoma.

Early Diagnosis of Carcinoma of the Stomach.—E. Schütz (*Wiener klinische Wochenschrift,* August 7, 1924) draws the conclusion that the diagnosis of carcinoma of the stomach is justified even in the absence of other objective signs in the presence of anacidity associated with an abundant bacterial flora in the gastric contents (long or short bacilli) and that the finding of coincident symptoms of a pyloric stenosis makes the diagnosis of an early stage of this disease possible. This finding also has another practical bearing, namely, that in such cases one should not be satisfied merely was a gastroanastomosis, but the radical operation should be done wherever possible. Whether the outlook for a permanent cure is more favorable than in the more advanced disease, only the future can tell.

Lymphosarcoma of Small Intestines.—F. W. Rankin (*Annals of Surgery,* November, 1924) finds that treatment by whatever methods undertaken usually yields unsatisfactory results. If the diagnosis be established before too much lymphatic invasion has taken place, surgery seems to offer the best chance of cure or at least the most palliation. Where the process is extensive and where a resection would involve the sacrifice of too wide an area of bowel substance palliative measures such as sidetracking operations are indicated. Radium in certain sarcomatous cases has given such excellent results that some observers have been stimulated to urge its use in this condition. Certainly the end results from surgery are poor, even from the viewpoint of prolongation of life, to urge it as other than a last resort. Under any of the present day treatments the prognosis is poor, and unless the early diagnosis of this condition can be made there is relatively little chance of instituting other than palliative measures. It is suggested that radiological evidence may be of greater value in an early diagnosis of these lesions under a more improved technic than we have at present. The insidiousness of the disease and its lack of a consistent symptom complex seem to show conclusively that we must look to the röntgenologist for progress in making an earlier diagnosis, if we are to reduce the mortality by any therapeusis now available.

CARDIOVASCULAR DISORDERS

Action of Quinidine in the Treatment of Heart Disease.—John Hay (*Lancet,* September 13, 1924) cites the following types of cases in which it is admittedly unwise to administer quinidine:

1. It is more than probable that little or nothing is to be gained from quinidine in badly damaged hearts with valvular disease of long standing, and more particularly if there is undoubted failure of compensation with venous engorgement. Here digitalis is the best drug to administer in the attempt to control the ventricular rate and improve the reserve power of the heart. 2. Occasionally, in a patient who has suffered severely from angina pectoris, the onset of fibrillation is followed by the cessation of the anginal pain, and it is a question whether one should attempt to restore a normal rhythm under these conditions. 3. Idiosyncrasy. Rarely the patient is unduly sensitive to quinidine, and to push the drug induces unpleasant or even dangerous consequences. 4. All cases of acute or subacute infective endocarditis. 5. A history of embolism would be a factor against the administration of quinidine.

The cases suitable for quinidine treatment are the following: Quinidine is most likely to be of service when the fibrillation is of recent development, and when there is but little cardiac enlargement and no valvular disease; as, for example, a case of paroxysmal fibrillation with the last paroxysm persisting. Another favorable type of case is that of a patient in whom the onset of fibrillation was due to, or at least associated with, an acute infection, such as influenza or the presence of an infective focus. When the onset of distress definitely dates from the incep-

ion of fibrillation, and it is clear that the abnormal rhythm s the disabling factor, then the advisability of adminis- ering quinidine should be favorably considered. Quinidine las proved of great value in the fibrillation associated vith exophthalmic goitre, especially where partial thyroid- ctomy has been performed and the fibrillation persists. Quinidine is also valuable before operation in the milder ases of exophthalmic goitre in which fibrillation is present. Each case must be considered on its own merits. There re no hard and fast rules. Often the results are far etter and more permanent than was to be expected— nore frequently, however, they are disappointing. Either he fibrillation persists or the recovery is only temporary. When it is permanent most patients are conscious of some hange for the better. The symptoms are ameliorated nd the cardiac reserve is increased. In favorable cases normal mode of life is resumed. Quinidine is given vith the hope that it will restore a normal rhythm, but he result is sometimes disappointing.

Action of Tartar Emetic on the Heart.—William D. Reid (*Boston Medical and Surgical Journal,* December 18, 924) has studied the action of tartar emetic, which ormerly was popular as a circulatory sedative, by means f the electrocardiograph in a small group of clinically ormal hearts, and in others affected by auricular fibrilla- ion and ventricular extrasystoles. The most noteworthy indings were: Reduction in the heart rate, prolongation f the P-R interval, increase in the height of the T wave, nd slowing of the rate of the circulating wave in auricular ibrillation.

Adrenalin Treatment of Stokes-Adams Attacks.—John Parkinson and C. W. Curtis Bain (*Lancet,* August 16, 924) recall that whatever the block, it is only where he attacks depend upon strong vagal influence—a rare vent—that the commonly used subcutaneous injection of tropin might be expected to succeed. Clinical experience onfirms this and shows that it is most uncommon for tropin to control the attacks. On pharmacological grounds drenalin might be expected to have a wider application han atropine in the treatment of Stokes-Adams attacks. t can facilitate conduction when partial block is present. What is more important is that it can directly increase he rate of a dissociated ventricle. Further, it has been linically shown, even if the block is uninfluenced and he ventricular rate is not increased, adrenalin can abolish he recurrent standstill of the ventricle which under these onditions determines the syncope. The authors believe hat the subcutaneous injection of adrenalin, using five o ten minims of the 1 to 1000 solution, is the most romising method of treating Stokes-Adams attacks.

Stair Climbing as a Test of Cardiac Function.—J. H. Wallace (*American Journal of Diseases of Children,* Sep- ember, 1924) used the following test: The work consisted f a rapid climb (a trot) up forty steps, an elevation of wenty-three feet, from the ground to the third floor. This ncluded walking on the level of about twenty feet and naking five turns. It was usually accomplished in about wenty-three seconds. For a five minute interval prior to he climb the patient was seated at the foot of the stairs, hen the blood pressure and pulse rate recorded. Immediately ollowing the climb the patient was again seated at the top f the stairs and the blood pressure and pulse rate read very thirty seconds for a period of six minutes.

The children recommended, on the basis of history and hysical examination, as having chronic heart disease with lightly diminished exercise tolerance, performed the activi- ies of normal childhood easily and without evident physical letriment. Rather strenuous stair climbing was performed y this group easily and without evidence of cardiac em- arrassment. A study of the blood pressure reaction changes after a given piece of work reveals that in children with mild heart disease the reaction time is usually longer than in children with normal hearts, and that it is longer still in children with more severely damaged hearts.

The blood pressure and pulse rate reaction times follow- ing a given work test were recorded before the beginning of a period of supervised rest, play and work and again from three to four weeks later. Although the subjects showed obvious general improvement, a comparison of the two sets of reaction periods showed a tendency toward increasing, rather than decreasing, blood pressure and pulse rate reaction periods.

A Heretofore Neglected Form of Respiratory Disturbance in Angina Pectoris (Aortic Dyspnea).—Sigmund Wassermann (*Wiener klinische Wochenscrift,* September 11, 1924) describes a peculiar form of respiratory disturbance occurring in attacks of angina pectoris, which may be recognized by the following characteristics:

1. It occurs simultaneously with the anginal attack or introduces it (as a premonitory sign) and runs its course along with the attack. As the anginal attack is relieved, the dyspnea also disappears.

2. It is associated with the sensation of difficult breathing (dyspnea), of constriction (oppression) and of fear (angor). Frequently it is experienced as painful and oppressive (sternal or precordial pressure).

3. In cases with frequently recurring anginal attacks it appears as a stenocardial equivalent and the purely painful stenocardial factors cannot be differentiated sharply enough in the dyspneic "attacks." The identification of these stenocardial dyspneic equivalents is made possible by the prominence of formerly typical anginal attacks.

Adynamia and Hypodynamia of Muscle and Their Therapeutic Problems.—J. Pal (*Wiener klinische Wochenscrift,* May 29, 1924) states that digitalis can aid the functional ability of the heart through stimulation of the kinetic elements of the pathological heart, provided the new formation of energy substance is possible. In cases of cardiac weakness that is of tonic origin, more is to be expected from caffeine and less from digitalis. In the presence of a normal frequency caffeine alone is preferable owing to its advantages for the coronary bloodvessels, the bronchi, and the pulmonary circulation.

For the purpose of building up the tonus, nutritive substances, of which the infusion of dextrose was found best by the author, are necessary. The author's investigations have shown that the shorter the duration of the process, the greater was the effect, because the structure of the muscle fibre was still sufficient. The building up of the tonus of the other hollow viscera is still a moot question. The adynamias of voluntary muscle of neurogenic origin present the simplest problem. The reconstruction may be accomplished through the physiological stimulation as soon as the etiological process has returned to normal. On the whole, the conclusion may be drawn that the result of treatment is dependent not only upon the choice of the remedy but also upon the existing structural condition of the cells, and this presents the greatest difficulties.

Cervical Sympathectomy in Angina Pectoris.—William H. Holmes and S. W. Ranson (*Journal of Laboratory and Clinical Medicine,* December, 1924) describe the case of a white woman fifty-three years old, in whom the paroxysmal pain of angina pectoris was relieved by the removal of the superior sympathetic ganglion. She has remained under observation for eleven and a half months without a single recurrence of thoracic or brachial pain of the anginal type. The beneficial effect of high cervical sympathectomy in attributed to section of the vasoconstrictor fibres by the authors, instead of to section of sensory fibres, as is done by Coffey and Brown. The authors state that the idea that the paroxysms of angina pectoris are due to structural change plus vascular spasm has long held a prominent place among the theories advanced in explanation of the symptoms of the disease. Not being able to account for the results obtained by section of the superior cardiac nerve on the basis that it contains sensory pathways, the hypothesis is advanced that this nerve contains vasoconstrictor fibres for the aorta and coronary arteries, and that section prevents spasmodic vasoconstriction and, therefore, stops paroxysmal pain, but is without effect on pain caused entirely by structural changes.

Massage of Heart in Cardiac Arrest.—W. E. Lee and T. McK. Downs (*Annals of Surgery,* October, 1924) report on several cases, concluding that the earlier cardiac massage is instituted after cessation of the heart beat, the greater is the likelihood of success. Time should not be lost waiting for hypodermic stimulation to act. If the circulation has actually stopped, it cannot act. The quickest and the easiest method of approach is the best. This is usually the abdominal transdiaphragmatic route. If this is not successful within two or three minutes, the diaphragm should be incised, the heart grasped in the hand and directly stimulated. No patient should be abandoned until cardiac massage has been tried without success.

Aneurysm of Palmar Arches.—H. H. M. Lyle (*Annals of Surgery,* September, 1924) offers the following conclusions to a tabulated series of cases: Aneurysms of the superficial palmar arch are not common, aneurysms of the deep palmar are extremely rare, only eight having been recorded. The majority of the cases are caused by trauma with direct injury to the vessel wall, an insignificant number result from local or general pathological disease of the vessel wall, a small group are caused by chronic irritation and repeated contusions. The best treatment is an early excision of the aneurysm; this applies to both the superficial and deep arches. As a prophylactic measure, all narrow penetrating wounds which bleed freely and are in possible relation to the palmar arches, should be explored and both ends of the artery secured. Although these aneurysms do not occur frequently, we should remember their possibility and in the prognosis of a trauma to the palm reserve a place for them.

Aneurysms of the Iliac and Femoral Arteries.—J. E. Thompson (*Annals of Surgery,* June, 1924) traces the circulatory routes through the various arteries with a view to explaining the complications consequent upon operation of this disease. The most effective operative treatment for an aneurysm arising from the external iliac and encroaching on the bifurcation of the common is to tie both common and internal iliac arteries simultaneously. The intrasaccular suture of Matas is less likely to be followed by complications than any other method of treatment, first, because evacuation of the clots from the sac relieves the surrounding tissues from pressure. This allows the collateral arteries to open up to their full capacity and often relieves impending gangrene. It also allows the companion veins to expand and edema is similarly relieved. Both these results are seen with surprising rapidity after evacuation of the clots from a popliteal aneurysm. Secondly, the suture of the arteries opening into the sac is done from within, consequently the walls of the sac are not disturbed, and collateral channels cannot possibly be injured. Further, any vital trunk, such as the profunda femoris or internal iliac, is closed by suture at its mouth, and the arterial stem and its branches are not endangered.

Arteriovenous Aneurysm.—E. Holman (*Annals of Surgery,* December, 1924) finds that clinically the circulatory changes following the introduction of an arteriovenous fistula are dependent primarily upon the size of the fistula and upon an unobstructed return flow to the heart. Small fistulas, however long they may have existed, do not cause changes in either vessels or heart. Slightly larger fistulas may result in an enlargement of the proximal vein, but no visible change in the heart or proximal artery. Large fistulas are inevitably accompanied by changes in both artery and vein and usually by a demonstrable enlargement of the heart. The extent of these changes is intimately dependent upon the size of the fistula. These clinical observations are identical with those found in the experimental laboratory and are undoubtedly dependent entirely upon the amount of blood which finds its way through the fistula back to the heart.

Pathology and Surgical Treatment of Angina Pectoris.—Daniélopolu (*British Medical Journal,* September 27, 1924) suggests that in angina pectoris there should be cut the cervical sympathetic cord, and the vertebral nerve above the inferior cervical ganglion, the nerve of Hofer, or any corresponding nerves present, and the nerves which spring from the cervical sympathetic cord above the superior cervical ganglion and pass to the heart. Thus, while preserving the important centrifugal nerves which are essential to the action of the heart, we are cutting the greater number of ascending sensory fibres to which is assigned an important part in the launching of the anginal attack. Only by this operation as detailed above can permanent benefit be obtained. The lateral sensory group which enters the thoracic cord is certainly left intact, but this group is only of secondary importance. Since the principal site of the anginal attack is the left side of the heart, and it is the sensory nerves of the left side which are mainly affected, the operation must be performed on the left side in the first place. Is it necessary to complete it on the left side? It would be difficult to give any categorical answer, but it is more than likely that in the majority of cases the operation on the left side would be sufficient.

None of the surgical methods suggested can yet be considered the ideal; it is certain that cervicothoracic sympathectomy must be absolutely abandoned, while each of the other methods has as yet done no more than establish a right to be considered in therapeutics. In the present state of our knowledge regarding the innervation of the heart and aorta in man it is only possible to outline a hypothesis, but research is proceeding.

Aneurysm of the Splenic Artery.—E. A. Baumgartner and W. S. Thomas (*Surgery, Gynecology and Obstetrics* October, 1924) present a tabulated series of forty cases thirty-three of which were diagnosed at autopsy. With reference to the diagnosis they conclude that with the symptoms of abdominal pain, gastrointestinal hemorrhages splenic and epigastric tumors, and x ray studies ruling out tumor of the stomach, aneurysm of the splenic artery should be considered and operation advised, for in operation lies the only hope of recovery in these cases.

Aneurysm of Internal Mammary Artery.—F. W. Rankin (*Annals of Surgery,* September, 1924) gives several differential diagnostic signs between aortic and internal mammary aneurysm, and says, of the treatment, that the rich anastomosis between the intercostals and phrenics below suggests the impossibility of cure without radical extirpation of the sac. The resection of a portion of the chest wall and the costal cartilage following a preliminary ligation of the vessel in the first or second interspace and also below the aneurysm, with a total extirpation of the sac, is a feasible procedure which may be carried out without injury to the pleura or danger of unpleasant sequelæ.

A Cardiac Index for Children.—J. Epstein (*Archives of Pediatrics,* September, 1924) states that a large number of valuable experiments by means of dumb bells, iron bars and the ergometer have led to the following conclusions:

A moderate amount of work will cause no change in the systolic blood pressure in normal children. With an increased amount of work, there will be a systolic rise in blood pressure immediately after work, which quickly returns to the original level. When the work is increased to the point of fatigue, there will be a delay in the systolic rise and a slow return to the normal. But when a moderate amount of work produces a systolic delay, it is evidence of a functional cardiac insufficiency. An oscillation in blood pressure after a moderate amount of work, consisting of a primary fall followed by a rise and a return to normal means myocardial weakness. The systolic rise or delay cannot fully interpret the cardiac functional capacity, however, because the blood pressure in itself is a component of various factors.

Gradient efforts of moderate running, climbing stairways walking on level ground, and resting with a corresponding graded cardiac index of 1.0, 0.75, 0.5 and 0.25 will serve as a reliable and useful guide to the cardiac vital capacity. These exercise tolerance tests require no special instruments, do not exhaust the patient and do not throw out of gear other systems and organs of the body. In the young child it can easily be estimated by the subjective and objective reactions while an older child can fully express his cardiac responses to these daily tasks imposed upon it. They are easily applied and are drawn from the child's daily exertions.

A child with a cardiac index of 1.0 requires no treatment except graduated exercises to strengthen his cardiac reserve. One with a cardiac index of 0.75 needs occasional medication and careful exercise. An index of 0.5 calls for a great deal of rest and digitalis. When the index is only 0.25 the little patient must be completely at rest and digitalized.

The cardiax index is determined as follows: When, in spite of some mechanical valvular impediment, the child can perform all the types of exercise without drawing on his cardiac reserve and experiencing shortness of breath, fatigue or other evidence of heart weariness, his cardiac index is 1.0 (100 per cent.). If he cannot do moderate running without dyspnea or other cardiorespiratory distress and is only able to climb the usual number of stairways, the index is 0.75. If the child can neither do moderate running nor walking up stairways without overloading the heart, and can walk only on level ground, the index is 0.5. When the cardiac reserve is so far exhausted that the child is unable to run, climb stairs, or even walk on level ground and is comfortable only when at rest, the cardiac index is 0.25. Failure of compensation even at rest means cardiac dissolution.

PEDIATRICS

Diphtheria Immunity.—W. H. Park and Abraham ingher (*American Journal of Diseases of Children,* October, 1924) draw the following conclusions from a study of ıe immunity results obtained with diphtheria toxoid (modified toxin) and one tenth L+mixtures of toxin-antitoxin in ıe public schools of New York City.

1. Both the new toxin-antitoxin and the toxoid preparations give good immunizing results with but slight local ıd constitutional reactions.

2. The toxoid has advantages in that there is no horse rum in it to cause sensitization, which happens to a slight egree with toxin-antitoxin. The substitution of goat antioxin for horse antitoxin will obviate this difficulty and ıis change is now being made.

3. Such a toxoid would do away with the fear in the popuıtion created by the recent experience with frozen toxinıtitoxin.

4. A satisfactory toxoid preparation is probably easier to ıake and also more stable.

5. In making toxoid by the addition of formaldehyde to oxin, care must be taken of the amount of formaldehyde ıded and the period of time the formaldehyde treated oxin is exposed to the temperature of the incubator. The mount of amino acid nitrogen, as determined by the van lyke method, has a definite bearing on the amount of ormaldehyde that is necessary to be added. Many of the oxin preparations containing from 2.5 to 5 mg. of nitrogen er 10 c. c. will require the addition of 0.1 per cent. ormaldehyde and the exposure in the incubator from four five weeks.

6. Careful tests of the minimum lethal dosage, the L+ ıd the flocculating value of the toxoid should be made in andardizing the preparation. The minimum lethal dosage epresents the remaining trace of free acting toxin, the L+ ıd the flocculating value, the combining power of the toxoid. he combining value of toxoid serves as a good index of s immunizing value. It is of advantage to have a slight xcess of free toxin (from 1/15 to 1/20 minimum lethal ose in each dose) in the toxoid.

7. Toxoid and toxin-antitoxin should be carefully studied ıd, if possible, improved, and the one that is shown to be ıe best adopted for general use.

Mongolism.—Thomas Brushfield (*British Journal of hildren's Diseases,* October-December, 1924) reports his ndings in a series of cases of mongolism. The etiology ıd pathogenesis are still obscure. The various factors beeved to be effective include syphilis, contraception, neuroıthic family history, an abnormally small and tight amnio c sac during intrauterine life, position in the family, and ıe mother's age and health in pregnancy. The clinical ıaracters are distinct. With the exception of the tongue, one alone is characteristic, and any single one may be ound in other varieties of amentia. In the order of their nportance they are: the brachycephalic skull, the small ounded "bullet head," having a high cephalic index; a attened and rounded face, the cheeks marked with irregular d blotches, fine hairs over the forehead, dry, coarse, often aly skin and a fairly high forehead with no recession. he palpebral fissures slope outward and upward. Epiınthus is common. Nystagmus is seldom seen, and then ry coarse movements are present. The iris may be ottled or marbled, or speckled. Vision is generally defecve, due to hypermetropic astigmatism. Cataract may be esent. More or less strabismus is present without exceon. Blepharitis and conjunctivitis may become obstinate ıd chronic. The tongue is often protruding, very large, ick and long; the circumvallate papillae become hyperophied; transverse, fissures appear and become more arked with advancing age. The mouth is generally open ıd the lips often show longitudinal fissures and cracks. entition is generally late and nearly always irregular; the eth are brittle and decay early. The dry mouth with fective salivary secretion favors the occurrence of caries. fter the sixth year there is nearly always alveolar hyperophy; it is narrow, high, often with a central, well develed ridge in the vertical plane; the sides often appear vertıl. The voice is gruff, low pitched, guttural. The ears e small, badly developed; all are simply convoluted, some ıellshaped. The nose is short, generally squat, nostrils oking forward and narrowed, with a markedly depressed idge, and an associated nasal catarrh. The nasopharyngeal cavity is small and shallow. The hair is generally light or medium brown in color, coarse, wiry in boys, often scanty and splitting; the skin of the scalp is scaly or scurfy. The skin is dry, harsh, thickened on feet and hands. Blue patches or spots may be found in the intergluteal fold and sacral regions, and are congenital. Lax ligaments are especially characteristic. The vulnerability of all mucous membranes is marked.

The hand is very variable, but generally the whole hand is clumsy, stumpy; there is incurving of the fifth finger; relative shortness of thumb and fifth finger as compared with the index and fourth finger: the main lines on the palm are obliterated or broken up and replaced by many secondary ones, and there are horizontal lines running across the palms, close to the finger clefts, and the thumbs are slightly rotated inward; deformities, such as webbed fingers or double fingers. Their limbs quickly become cyanosed with dry skin. The whole foot is short and clumsy. There is a marked gap between the first and second toes, and a deep line running from this gap on the plantar surface. The big toe seems larger and out of proportion to the rest. Flatfoot is common. Chilblains are frequent.

All Mongols are dwarfs. The average age at death is six to seven years. Acute illnesses respond very slowly or not at all to therapy. A patent foramen ovale of the heart is very common. Various authors are agreed that a certain arrest of development takes place at the base of the skull.

Investigation of Fifty Cases of Mongolian Idiocy.—Dora M. Berry (*British Journal of Children's Diseases,* October-December, 1924) analyzed a series of fifty Mongolian idiots. Little evidence was obtained to support the prewar theory that Mongolianism was due to the mother reaching the end of the childbearing period. Much evidence was obtained that it was the father who was sexually defunct, as in two thirds of the cases he had served in the War, and in nearly half he had suffered from shell shock, while the mothers were young and healthy.

Gastroenteroptosis in Children; Its Relation to Recurrent Vomiting with Ketosis.—DeWitt H. Sherman and Edward C. Koenig (*Archives of Pediatrics,* September, 1924) conclude that recurring vomiting attacks in children are frequently due to gastroenteroptosis, either a simple mechanical abnormality or one markedly influenced by perverted nervous reactions. Recent rôntgenological studies have shown many new facts concerning the motility of the gastrointestinal tract. Where the condition is pronounced. posture, rest or support are essential for a cure. If gastroenteroptosis is the cause of the recurring attacks of vomiting the relief or prevention by means of a properly applied and fitting support is dramatic. The only time to cure gastroenteroptosis and its symptoms is in young children. It can merely be relieved but not cured in the adult.

In the authors' cases, the gastroenteroptosis was moderate, the enteroptosis and dilated tortuous sigmoid being more marked, especially the latter. In the older children, this tortuosity favors constipation and stagnation with fermentation and putrefaction.

An Epidemic of Diphtheria in an Immunized Group of Children.—R. P. Forbes and Berryman Green (*Archives of Pediatrics,* September, 1924), present the following observations based on a study of an epidemic of diphtheria in a childcaring institution.

The routine administration of toxin-antitoxin insures a low morbidity and mortality. There were only eleven cases of diphtheria among 135 children, of which two were extremely doubtful, and no deaths or complications.

It is not a safe or economical procedure to omit the Schick test after the administration of toxin-antitoxin. Fifteen cases or 16.8 per cent. of those immunized six months or more before the epidemic were Schick positive. The high percentage may have been due to faulty technic in performance or reading of the test or to poor toxin-antitoxin. The possibility of Schick negative persons developing diphtheria must always be kept in mind. Of the eleven cases recorded, six were Schick negative, but only three of these were typical of pharyngeal diphtheria and one received no antitoxin. A group of five children presented both positive Schick tests and positive throat cultures, but developed no diphtheria. All of the typical clinical cases had their tonsils and 43.67 per cent. of the contacts showing positive cultures had tonsils.

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Medicolegal Notes.

HOSPITAL NOT LIABLE FOR NEGLIGENT WRAPPING OF HOT WATER BOTTLE BY PATIENT'S PHYSICIAN

The Wisconsin Supreme Court holds, Kuglich v. Fowle, 200 N. W., 648, in an action against a hospital and a physician to recover damages for a burn from a hot water bottle wrapped by the physician and placed in the plaintiff's bed to induce perspiration where the liability of the hospital was predicated upon the fact that it was the duty of the nurses to wrap the bottles, and that the hospital was responsible for the negligent wrapping, that the hospital could not be held liable, although the physician, who was the plaintiff's physician, was also an officer of the corporation owning the hospital and the real manager thereof.

POWERS OF DIRECTORS OF PRIVATE HOSPITALS UNDER NEW YORK MEMBERSHIP CORPORATION LAW

The New York Appellate Division holds, Van Campen v. Olean General Hospital, 210 App. Div., 204, 205 N. Y. Supp., 554, that hospitals established by certain municipalities under the New York statutes are public hospitals. Corporations organized by permission of the Legislature undertake to perform similar duties. They are supported mainly through voluntary gifts. These are private corporations. That they are engaged in charitable work for the benefit of the public, and thereby affected with a public interest, does not make them public corporations. The fact that they may receive a donation from the government to enable them to carry on their work, or funds from a city or county to care for sick, disabled indigent persons, does not affect their character as private institutions.

It is held that the Olean General Hospital, a nonstock corporation organized under the General Corporation Law and Membership Corporation Law, whose affairs are in many respects regulated by statute, whose directors and officers may receive no pay except under certain circumstances, and which is subject to visitation, inspection and supervision by the state board of charities, is a private corporation, although it is exempt from liability for negligence to patients and is exempt from taxation.

There being no provision in the corporation's by laws for a hearing prior to removal or suspension of one of the visiting staff, it is held that none is required. The selection and retention of physicians to treat patients admitted to the hospital are held to be matters of judgment and discipline. "The power to appoint," the court says, "usually implies the authority to remove. In common experience instances are not unusual where some physician disagrees with hospital management. When such disagreement becomes so pronounced as to interfere with orderly management and discipline, and when there is persistent violation and disobedience of necessary rules and regulations, we think the directors may bring the inharmonious conditions to an end by summary action. They are not required, in our judgment to give notice and conduct a trial in every such case."

EVIDENCE OF PHYSICIAN'S WEALTH INADMISSIBLE IN MAL- PRACTICE CASE—DEGREE OF SKILL AND CARE REQUIRED

The New Jersey Supreme Court holds, Smith v. Corrigan 126 Atl., 680, that in an action for damages against a physician for malpractice, evidence of the physician's wealth i inadmissible, even though punitive damages be demanded i the complaint, unless there is evidence of malice or wrongful motive toward the plaintiff on the part of the defendant The court in its syllabus also says that it was error to charg a jury that a physician responding to a call impliedly engage to employ the degree of skill and knowledge ordinarily exercised in his profession by physicians of good standin practicing in the locality and similar localities. The ski and care a physician is required to give a patient, the cou holds, is that ordinarily possessed and exercised by others i the profession.

RIGHT TO PERFORM OPERATIONS IN HOSPITAL

The Maryland Court of Appeals holds, Emergency Hosp tal of Easton v. Stevents, 126 Atl., 101, that a hospital whic has been enjoined from interfering with the performance o operations by a physician is guilty of contempt of court i refusing permission to perform such operations, althoug subsequent to the decree of injunction it had amended i constitution and by-laws in such a way that the physicia had no right thereunder to operate in the hospital without th approval and consent of the hospital staff, which he had n obtained.

RIGHT TO TAKE DEPOSITIONS IN MEDICAL BOARD'S INVESTIGA TIONS UNDER MISSOURI STATUTE

The Missouri Supreme Court holds, State v. Shot, 2 S. W., 804, that in the exercise of its police power th legislature has the right to vest in the state board of heal the power to investigate and license physicians, to investiga charges against a licensed physician, and in proper cases revoke such license. Missouri Rev. St. 1919, §7336, not on empowers the board to hear and determine the charges, b says that it may consider depositions in the course of su hearing, and, if an investigation is pending before the boar testimony for the purpose of the hearing "may be taken deposition to be used in evidence," in the same manner depositions are taken to be used in evidence in civil ca When, therefore, there are pending before the board charg against a physician, and said physician has been given noti thereof, it is held that the pendency of such charges autho izes a notary public to take testimony by depositions, just such notary public is authorized to take testimony in a ca pending in a court. The right to take the deposition und section 5440, K. S. 1919, is not dependent upon the sufficien of the petition in stating a cause of action, since, if t petition states no cause of action, it may be amended wh the investigation is yet pending.

UNDER MISSOURI STATUTE EVIDENCE BEFORE STATE BOARD HEALTH MAY BE BY DEPOSITION

The Missouri Supreme Court holds, State v. North, 2 S. W., 678, that Rev. St. 1919, §7336, relating to the revo tion of physicians' licenses, does not confer power, even implication, upon the state board of health, in a proceedi to revoke a license for unprofessional conduct, to issue su poenas for witnesses at the physician's request. While ph sicians cannot be deprived of their licenses without d process of law, and this requires a hearing after due not to the party, the Missouri court holds that §7336 does violate the due process clauses of the state or federal C stitutions because it provides for the evidence to be su mitted by deposition rather than by the personal attenda of the witnesses. It is held that the section, which provi for a hearing upon evidence after due notice, and for judgment after such hearing and a court review of whole proceeding, gives to physicians ample means of mak a full defense to charges filed against them before the st board.

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Coughs and Colds

that tend to linger and fail to respond to remedies usually employed, almost always owe their persistence to inability of the body to restore a physiologic balance. Restorative and reconstructive treatment is essential and the ideal remedy is

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(Formula Dr. John P. Gray)

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Miscellany.

Scholarships in Mental Hygiene.—The Rockefeller Foundation has appropriated to the National Committee for Mental Hygiene the sum of $40,000 for the establishment of a series of scholarships in extramural psychiatry and psychiatric social work. These scholarships are designed to provide special training for physicians who have had previous hospital training in psychiatry but who wish to prepare themselves for extramural work in child guidance, delinquency, education, dependency, and industry; and for the training of social workers in social psychiatry.

The scholarships are open to physicians under thirty-five years of age, who are graduates of Grade A medical schools and have had at least one year of training in a hospital for mental disease maintaining satisfactory standards of clinical work and instruction. A longer period of hospital training is desirable. Applicants for the scholarships in psychiatric social work must hold a collegiate degree, be under thirty years of age, and be free to devote themselves to a period of professional work upon the completion of their training.

The course of training in extramural psychiatry will be kept sufficiently flexible to complement as closely as possible the previous experience of the scholars in psychiatry. Assignments for various lengths of time, for work under supervision, will be made to well established clinics handling problems of childhood and adolescence, delinquency (juvenile and adult), dependency, and industrial problems. Opportunity will be given to each scholar to study under supervision as many types and manifestations of behavior disorder as are commensurate with adequacy of study.

Scholarships will be awarded by vote of the executive committee of the National Committee for Mental Hygiene on recommendation of the medical director. Application blanks may be obtained from Dr. Frankwood E. Williams, 370 Seventh Avenue, New York, N. Y.

Infectious Diseases Abroad.—The following general summary, compiled from the monthly Epidemiological Reports of the Health Section of the League of Nations, supplemented, when possible, by more recent information from other sources, appears in *The Lancet* (London), December 6, 1924.

Plague.—In India this year the curve of plague mortality dropped to its lowest point in the last week of July, which is a few weeks later than usual. The curve has since risen steadily to an average of about five hundred deaths a week for the country as a whole. In the week ending November 15 no death from the disease was notified in the ports of Bombay, Calcutta, Karachi, and Madras, but there were three in Rangoon. As regards other parts of the world, the following is a list of countries or localities in which the disease has recently occurred: Europe: Crete (August), Greece, Naples, Paris. Asia: Beyrout, Ceylon, Dutch East Indies, Baghdad, Jaffa, Bangkok, Singapore. Africa: Algeria (August), Canary Islands, Gold Coast, Madagascar, Mauritius, Nigeria (Lagos), Uganda, Union of South Africa. America: Ecuador and Los Angeles.

Cholera.—In India during August the reported cholera cases averaged about 8,050 a week and deaths 4,850. For the week ending September 27 the figures were 4,251 cases and 2,422 deaths. Very few cases have recently been reported from other parts of the world.

Yellow fever.—Sporadic cases continue to be notified from the Gold Coast and from ports of Mexico and other countries in Central America. It is estimated that at San Salvador there were sixty cases between June and September.

Typhus.—The typhus situation in Russia and Eastern Europe at present is believed to be more favorable than in any year since the war, but as regards most of the countries June is the last month for which full statistics are available. In Poland only 246 cases were notified during August: Esthonia, Latvia, Lithuania, Czecho-Slovakia, Jugo-Slavia, Roumania, and Bulgaria were almost or quite free from the disease. The most recent notifications from other countries are: Algeria, week ended October 31, four cases; Chile, wee kended October 13, twenty cases (at Talcahuano); Egypt, week ended November 11, fourteen cases, of which two were at Cairo; Italy, week ended September 28, one case at Sestoal Reghena; Malay States, week ended November 21, one case; Portugal, week ended October 18; one case at Oporto; Syria, week ended September 30, one case at Aleppo; Turkey, week ended November 8, one case at Constantinople.

Smallpox.—In general the smallpox situation abroad at present is decidedly favorable. Northern Europe (including Scotland and Ireland), the Baltic Republics, and Central Europe as far south as Roumania are almost or quite free from the disease, and it is declining in many other areas where it was prevalent.

Enteric fever.—In many countries enteric fever appears to have been more prevalent this summer than last. The increased summer incidence was particularly marked in the Baltic region (Sweden, Finland, Esthonia, and Latvia). In Denmark, however, only fifty-five cases were notified during August, as compared with 191 during the same month last year. In Germany, 1,967 cases were notified in the four weeks ending September 6, as compared with 1,680 during the preceding four weeks, and in Italy 1,159 cases during the week ending August 23, as compared with 373 cases during the previous week.

Scarlet fever and diphtheria.—In Germany and the Netherlands the incidence of these diseases during September was somewhat higher than last year. The following are a few recent statistics of deaths in certain cities: Paris, November 1 to 10, three deaths from diphtheria; Amsterdam, week ended October 11, one death from scarlet fever; Berlin, week ended September 27, two deaths from scarlet fever, three from diphtheria; Breslau, Cologne, and Frankfort-on-Main, week ended September 27, one death from scarlet fever in each; Leipzig, week ended October 25, three deaths from diphtheria; Munich, week ended September 27, two deaths from diphtheria; Budapest, week ended September 20, one death from scarlet fever, one from diphtheria; Warsaw, week ended November 8, ten deaths from scarlet fever, two from diphtheria.

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Capital Punishment.—At a meeting of the Medico-Legal Society, it was proposed that the present method of execution should be exchanged for that of poisoning by coal gas, says an editorial writer in the *Medical Press and Circular,* October 29, 1924. And it was contended that its introduction into the condemned cell at night, while the convicted person was asleep, would lessen the anticipation of his doom and avoid the unpleasant spectacle of the scaffold. On the other hand it was objected that if he did not know the night on which he was to die, he would probably lie awake many nights in expectation, while if he were forewarned he would certainly not sleep, and would be slowly suffocated while conscious. There can be little doubt, that in experienced hands the present method of execution produces a quick, easy and painless death. The walk to the shed is but a few paces, and the whole is only a matter of seconds. If death is not actually instantaneous the victim immediately becomes unconscious. The very necessity of capital punishment requires that its infliction should act as a deterrent, and as a middle course between the publicity of the guillotine and the privacy of the Socratic method, there is probably none better than the present.

Tetraethyl Lead Poisoning.—Tetraethyl lead poisoning recently has attracted so much public attention that it is most important that this type of acute poisoning should be differentiated clearly by symptoms from ordinary chronic lead poisoning. The symptoms are absolutely different.

Tetraethyl lead poisoning recently has attracted an acute encephalopathy. Autopsies reveal an injection of the meninges of the brain, particularly at the base, with also some congestion of the cortex. The symptoms are both subjective and objective. The patient first complains of persistent insomnia, and usually of more or less nausea with vomiting. He feels restless and nervous and tired. He loses all appetite and begins to lose weight. Subjectively, one of the first symptoms noticed is a marked drop in systolic blood pressure, which frequently falls below 100 and sometimes below 90. There may be some diminution in the pulse rate, and in some cases a subnormal temperature. Lead is found in the stools, and some patients recently examined have shown stippling of the red blood corpuscles, although this is not invariably present. Considerable anemia develops, though no paralysis. In the extremely severe cases there is acute delirium of sudden onset, of the type familiar with delirium tremens. That is with violent jactitation, delusions of persecution, efforts to get up and run amuck, smashing through windows, and shouting with acute maniacal raving. Death ensues from exhaustion.

Tetraethyl lead is a remarkably active poison, taking first place among the metallic poisons. It was first made by chemists in 1854. Since that time there have been occasional instances of poisoning of greater or lesser severity among workers in chemical laboratories. Quite recently the possibility of using this substance in improving the efficiency of all gasoline motors, and thereby conserving the world supply of gasoline fuel by about one quarter has been discovered. Moreover, the addition of this substance to gasoline would make possible the use of high compression engines. Hence, the attempt to manufacture it on a commercial basis. It should be emphasized that it only can be used in gasoline motors in extremely diluted form, usually 1 to 1,000.

The possible dangers in the manufacture of tetraethyl lead, however, are three, namely: First, through direct absorption through the skin, which takes place with extraordinary rapidity; second, through inhalation of toxic fumes, and finally, through accumulation of ordinary lead dust, the latter being capable only of chronic lead poisoning.

The chemical substances used in the manufacture of tetraethyl lead are lead, ethyl chloride and metallic sodium.—(*Industrial Hygiene Bulletin,* December, 1924.)

Linacre, Harvey and Sydenham.—Exactly four hundred years have passed since the death of Thomas Linacre, at whose instigation the College of Physicians of London was founded by royal charter; two hundred and sixty-seven since that of William Harvey, the most illustrious of its fellows; and three hundred since the birth of Thomas Sydenham. They form a remarkable trio.

From first to last a scholar, and incidentally a physician, Linacre afterwards abandoned medicine for the Church. He will be remembered not as a physician, but for his success in procuring the charter which placed the medical profession upon a stable basis, and for his translations of the works of Galen from the unfamiliar Greek into the then language of science, by which means the knowledge of ancient medicine was first made available to criticism, and the spirit of doubt and inquiry was engendered. In the reign of Henry VIII there were no party politics. There was only one party—Henry himself: only one question—his supremacy. Had Linacre lived long enough to know the tyrant in his latter years, who can say but that he might have shared the fate of Fisher and More?

Harvey, on the other hand, earned a far greater fame—posthumous though it was by his discovery of the circulation. He, too, was physician to the reigning monarch, but Charles, much as he desired it, never attained the absolutism of Henry. At Edgehill and elsewhere Harvey was exposed to personal danger in his attendance upon his royal master, while the loss of his manuscript notes and observations when his London residence was plundered by the rabble, was no less than a national disaster. But before the struggle ended Harvey had withdrawn from practice and from participation in the royal cause, and his last years were spent in peaceful retirement. It is a remarkable coincidence that the two outstanding figures in the history of seventeenth century medicine should be found in opposite ranks. Whereas Harvey was an ardent cavalier, Sydenham was "a roundhead of a family of roundheads." After serving with the Parliamentary forces he returned to Oxford, and adopting medicine as a profession applied himself to the study and observation of disease. There is no doubt that he suffered in consequence of his political principles but, like Harvey, his last years were passed in retirement. Each lived long enough to witness the downfall of the party he had supported: but each died in his bed.—(*Medical Press and Circular,* October 29, 1924.)

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Rural Medical Service.—Since 1918 the New York State Department of Health has been more or less instrumental in securing physicians for seventy-two rural communities in which medical service has been either lacking or inadequate. When a request for assistance in securing a physician has been received, the District State Health Officer has been asked to investigate and report whether in his opinion the need was as stated and whether a physician could reasonably expect to make a living in the place. Upon receipt of an affirmative report, the name of the place has been included in a list which has been sent to physicians inquiring as to locations.

At present there are twenty-nine places listed as being in need of physicians. In several the prospect of the communities securing and retaining physicians is very poor unless some provision is made for subsidizing them. Reports of district state health officers indicate that one town in Essex County is paying a physician $2,200 annually; another in Essex County voted at town meeting to pay $1,500; one in Washington County expects to provide a bonus to a physician now located there, the amount not yet determined; in a Lewis County village a church contributed the use of its parsonage and in one town in Dutchess County the Supervisor has made an indefinite statement that the town would "do something" to secure a physician. Thus far in 1924, sixty-three physicians have asked for information and in seven communities physicians have been secured, in at least four instances apparently through the department's efforts.

This work has now been turned over to Dr. Joseph S. Lawrence, executive officer of the State Medical Society, 51 Chapel Street, Albany, N. Y.

Principal Causes of Death in 1923.—The Department of Commerce announces that 1,193,017 deaths occurred in 1923 within the death registration area of continental United States, representing a death rate of 12.3 in 1,000 population, compared with a rate of 11.8 in 1922. The death registration area (exclusive of the Territory of Hawaii) in 1923 comprised thirty-eight States, the District of Columbia, and fourteen cities in nonregistration States, with a total estimated population on July 1, 1923, of 96,986,371, or 87.6 per cent. of the estimated population of the United States.

The increase in the rates from influenza, from 31.4 in 100,000 population in 1922 to 44.7 in 1923, and from pneumonia (all forms) from 102.1 in 100,000 population in 1922 to 109 in 1923, accounts for nearly half the increase in the rate from all causes. Some of the other causes for which the rates increased are diseases of the heart, measles, cerebral hemorrhage, whooping cough, cancer, automobile accidents, nephritis, railroad accidents, and accidental falls. Decreases appear in the death rates from tuberculosis (all forms), diphtheria, malaria, and typhoid and paratyphoid fever.

Of the total number of deaths reported, were 170,033 from heart disease, 105,680 from all forms of pneumonia, 90,732 from all forms of tuberculosis, 87,707 from cerebral hemorrhage and softening, 87,378 from nephritis, 86,754 from cancer and other malignant tumors, 75,626 from congenital malformations and diseases of early infancy, and 74,131 from accidental and unspecified external causes.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

EVERLASTING LIFE. A Creed and a Speculation. By. W. W. Keen, M.D., LL.D. Philadelphia and London: J. B. Lippincott Company, 1924. Pp. 86.

THE CURE OF OBESITY. By Doctor Jean Frumasan. Translated from the French by Elaine A. Wood. New York: William Wood and Company, 1924. Pp. 122.

INFANTILE PARALYSIS IN VERMONT, 1894-1922. A Memorial to Charles S. Caverly, M.D. Burlington, Vermont: State Department of Public Health, 1924. Pp. 375.

ESSENTIALS OF PRESCRIPTION WRITING. By Cary Eggleston, M.D. Third Edition Revised. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 146.

AIDS TO SURGERY. By Joseph Cumming, M.B., B.S., F.R.C.S. Eng. and Cecil A. Joll, M.S. Lond., F.R.C.S. Eng. Fifth Edition. New York: William Wood and Company, 1924 Pp. 434.

LES CHORÉS. Par Dr. Babonneix. Bibliothèque des Connaissances médicales, dirigée par le Docteur Appert. Avec 34 figures dans le texte. Paris: Ernest Flammarion, 1924. Pp. 278.

TEXTBOOK OF MATERIA MEDICA FOR NURSES. By A. L. Muirhead, M.D., and Edith P. Brodie, A.B., R.N. Second Edition. Illustrated. St. Louis: C. V. Mosby Company, 1924. Pp. 190.

MANUAL OF DISEASE OF THE NOSE, THROAT, AND EAR. By E. B. Gleason, M.D., LL.D. Fifth Edition, Revised. With 212 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 660.

CHEMISTRY IN INDUSTRY. A Cooperative Work Intended to Give Examples of the Contributions Made to Industry by Chemistry. Edited by H. E. Howe. New York: The Chemical Foundation, Inc., 1924. Pp. 372.

HUMAN CONSTITUTION. A Consideration of Its Relationship to Disease. By George Draper, M.D. With 208 Illustrations and 105 Tables. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 345.

DEVELOPMENTAL ANATOMY. A Textbook and Laboratory Manual of Embryology. By Leslie Brainerd Arey. With 419 Illustrations, many in color. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 433.

LANG'S GERMAN-ENGLISH DICTIONARY. Terms Used in Medicine and the Allied Sciences. Edited and Revised by Milton K. Meyers, M.D. Third Edition Enlarged. Philadelphia: P. Blakiston's Son and Company, 1924. Pp. 613.

FACIAL SURGERY. By C. P. Pickerill, C.B.E., M D., M.S. With an Introduction by Sir W. Arbuthnot Lane, Bart., C.B., M.S. Illustrated. New York: William Wood and Company; Edinburgh: E. & S. Livingstone, 1924. Pp. 162.

PRACTICAL SURGERY ILLUSTRATED. By Victor Pauchet. Translated by F. R. B. Atkinson, M.D. With an Introduction by Sir Charles Gordon-Watson, C.M.G., F.R.C.S. Two Volumes. London: Ernest Benn, Limited, 1924. Pp. 293-252.

ANATOMY OF THE HUMAN BODY. By Henry Gray, F.R.S. Twenty-first Edition, Thoroughly Revised and Re-edited by Warren H. Lewis, B.S., M.D. Illustrated with 1283 Engravings. Philadelphia and New York: Lea and Febiger, 1924. Pp. 1417.

OPERATIVE SURGERY. Covering Operative Technic Involved in the Operation of General and Special Surgery. Volume V. By Warren Stone Bickham, M.D., F.A.C.S. With 1118 Illustrations. Philadelphia and London: W. B. Saunders Company, 1024. Pp. 880.

CLINICAL STUDIES IN EPILEPSY. Composed of Clinical Notes on Some Epilepsies as Bearing on the Pathogenesis of Idiopathic Epilepsy. By Donald Fraser, M.D., F.R.F. P. & S. (Glas.) New York: William Wood and Coompany; Edinburgh: E. & S. Livingstone, 1924. Pp. 243.

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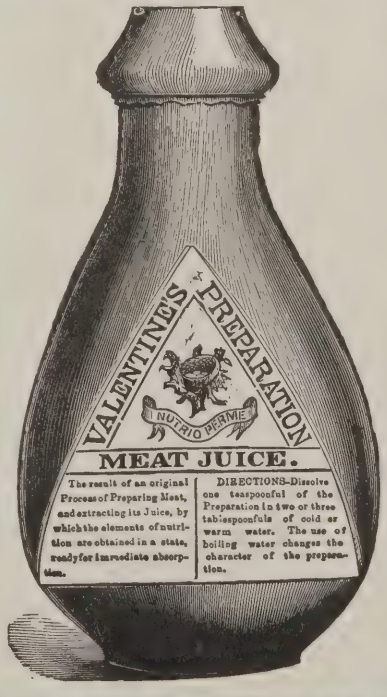
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Miscellany.

New Brain Disease Causes Japanese Epidemic.—A mysterious and unidentified disease has caused a severe epidemic in Japan which appeared first in provinces bordering the inland sea and then spread over the whole island empire. The first reliable reports of the outbreak have recently been received by the Health Section of the League of Nations at Geneva. The new disease was at first reported unofficially as cerebrospinal meningitis and then it was thought to be encephalitis lethargica, the socalled "sleepy sickness" which has been troublesome here and in Europe since the war. Finally it was found to be a hitherto unidentified epidemic disease involving the central nervous system, including the brain. The explosive character and the intensity of the new disease that appeared in July and continued in epidemic form at last reports surpass even the outbreaks of encephalitis and acute poliomyelitis, or infantile paralysis, which have been particularly acute in recent years. The incidence was nearly three per one thousand inhabitants in the most seriously affected province, Kagawa, and the mortality is reported as sixty per cent. This level of mortality is higher than that met in other serious disease such as encephalitis and poliomyelitis and approaches the fatality rate of deadly epidemic cerebrospinal meningitis.

The new disease is more likely to attack old people, particularly those over fifty years of age, than young, and more men than women are affected. Another remarkable feature is that more than one case per family or house occurs but rarely.

The central sanitary service of the Japanese Government and various medical colleges have investigated the new disease, but no causative microorganism has been found. No successful treatment has been evolved although the disease has been produced experimentally in rabbits.

The onset of the new disease is sudden and accompanied by a high temperature; after one or two days, loss of consciousness and a slightly maniac condition occurs. Either death comes in five to ten days or recovery is effected with a falling of temperature and regaining of consciousness.

Fatalities from Accidents During 1923.—The Department of Commerce announces that in 1923 practically one fifth of all fatalities from accidents were the result of automobile accidents. Approximately twice as many deaths from automobile accidents occurred in urban as in rural districts; a difference doubtless due, in part, to the greater number of hospitals in urban districts.

Of the thirty-eight states in the registration area, only three—Kentucky, Mississippi, and Wyoming—had higher mortality rates from railroad accidents than from automobile accidents. Wyoming had the highest mortality rate from railroad accidents, (34 in 100,000 population), and Massachusetts the lowest (3.5).

Wyoming also had the highest mortality rate from all kinds of accidents (195.4 in 100,000 population), and Mississippi the lowest (57).

California had the highest mortality rate from automobile accidents (32.6 in 100,000 population), and also from street car accidents (4.7), while Mississippi had the lowest rate from automobile accidents (4.4 in 100,000 population), and Wyoming had no deaths from street cars.

Of the sixty-six cities of 100,000 population and over, for which rates are shown, Camden had the highest mortality rate from automobile accidents (35.4), Buffalo the highest from street car accidents (8.9), and Scranton the highest from railroad accidents (16.4), and also from all accidents (144.5).

On the other hand, the lowest rate from automobile accidents (6.2) was for New Bedford, and the lowest rate from all accidents (47.3) was for Fort Worth, while Duluth, Jacksonville, San Antonio and Yonkers had no deaths from street car accidents, and New Bedford none from railroad accidents.

Of the 497 cities of 15,000 and over shown in the table attached, particular attention is called to the fact that no deaths from automobile accidents were charged against the following twenty-five cities, but here again the explanation of no fatalities in some cities may be the greater number of hospitals in larger cities nearby.

The Eyesight of School Children. — Only 4,227,702 of the 24,000,000 school children in the United States received eye tests in 1923, according to a preliminary report issued by the Eye Sight Conservation Council of America, embodying the initial findings of a nationwide survey of eye conservation in education and industry. The survey, which covers the results of testing the eyes of more than ten million students extending over a period of sixteen years, discloses, it is asserted, that the eyesight of children in the public schools throughout the nation is being neglected.

The data from which the Council's report was prepared were gathered from widely different sources, including reports of State Departments of Education and State Boards of Health since 1907, covering 6,600,000 eye examinations, and municipal reports since 1907 covering 3,500,000 examinations. The most recent statistics were obtained through data obtained from public schools of 247 cities, situated in the following eighteen states: California, Connecticut, Illinois, Iowa, Louisiana, Maine, Maryland, Massachusetts, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina and Texas. The other thirty states, it is said, conduct tests only in the schools of some of the large cities.

Simple visual acuity tests reveal that twenty-five per cent. of the school children in the United States have manifest defects of vision and symptoms of eyestrain. More thorough examination indicate that over fifty per cent. of school children have eye defect of sufficient degree to warrant correction. There is no uniform method for testing eyesight, says the report, which continues: "The reported percentages of total corrected and uncorrected eye defects vary all the way from 3.5 per cent. to 58 per cent. A city in New Jersey reported only 3.5 per cent. of 42,586 school children with corrected and uncorrected defective vision, a city in Missouri only 7 per cent. of 97,255, and a city in New Hampshire but 6.7 per cent. of 5,432. Such poorly conducted tests are of little value and the incorrect results are misleading.

In recommending an infant food —consider its nutritive value first

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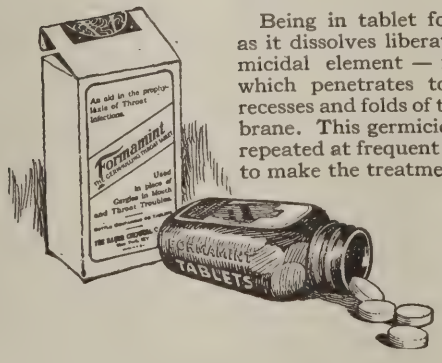

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GERM-KILLING THROAT TABLETS

Health Legislation, Sanitary Code Amendments, and Prosecutions During the Past Year.—A summary of the legislative activities of the Department of Health during the year 1923 appears in the August 30th issue of the *Bulletin* of the department. It should be remembered, in connection with all prosecutions undertaken by the Department of Health, that its main efforts are always directed to educational and preventive measures, and that the courts are only invoked as a last resource.

COURT ACTIONS

A comparison of court actions undertaken by the department during the year 1923 with those for the year 1922 shows an increase of 305 cases in the Court of Special Sessions, with a corresponding increase of $6,115 in fines, imposed for the year 1923. In the Municipal Term Court (Manhattan), during the same period, there was in increase of 556 cases disposed of, and an increase of $615 in fines. The Municipal Term, Borough of Brooklyn, 1923, shows 604 more cases than the previous year, with an increase of $6,302 in fines.

HEALTH LEGISLATION

A total of 3,862 bills introduced in both branches of the Legislature at Albany were examined for legislation affecting the interests of this department. It might be mentioned in connection with legislation that, at the request of this department, the Legislature, during the past year, amended the Labor Law so as to permit of the issuance of a sanitary certificate for bakeries which would remain in force until revoked by the Board of Health, in lieu of the provision which required the issuance of annual certificates.

SANITARY CODE AMENDMENTS

During the year 1923, seven amendments to the Sanitary Code were prepared and submitted to the Board for adoption. Such amendments related to the definition of x ray laboratories, the placing of dead horses on streets, the manufacture and preparation of sausages and of nonalcoholic drinks, the requirement that all persons handling food have medical certificates, the requirement for a permit to sell flavored water ices, and an amendment to the section standardizing ice cream to correspond with the State law on the same subject.

PROSECUTIONS

A number of very important convictions were obtained by the Department, including the conviction of a physician who was charged with having filed a false certificate of death in the Department. The physician in question stated in a certificate of death which he filed in this Department that the deceased, a woman of forty-four years of age, died of nephritis, edema of the lungs and endocarditis, when the deceased died of septicemia following abortion.

In several instances, appeals were made to the Supreme Court for orders directing the Board of Health to issue permits to various persons desiring to carry on business under permits from the Department and to whom permits had been refused by the Board. It is gratifying to state that, in every instance, the court sustained the contention of the Department in refusing the permits in question and throughout the past year the jurisdiction, power and authority of the Board of Health were completely sustained by the various courts.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

MURDER AND ITS MOTIVES. By F. Tennyson Jesse. New York: Alfred A. Knopf, 1924. Pp. 1924.

MEDICAL RECORD. Visiting List or Physicians' Diary, for 1925. Revised. New York: William Wood and Company, 1924.

SURVIVAL OR EXTINCTION. Social Aspects of the Jewish Question. By Elisha M. Friedman. New York: Thomas Seltzer, 1924. Pp. 297.

LEOPOLD AND LOEB. A Psychiatric-psychological Study. By Maurice Urstein. Chicago: Chicago Medical Book Company, 1924. Pp. 132.

ANESTHESIA FOR NURSES. By Colonel William Webster, D.S.O., M.D., C.M. Illustrated. St. Louis: The C. V Mosby Company, 1924. 153.

STRAWS AND PRAYERBOOKS. Dizain des Diversions. By James Branch Cabell. New York: Robert M. McBride and Company, 1924. Pp. 302.

PEDIATRICS. By Various Authors. Edited by Isaac A. Abt, M.D. Volume IV, with 218 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 1271.

DAS WESEN DER HEILKUNDE. Historisch-Genetische Einfuhrung in die Medizin. Fur Studierende und Arzte. Von Dr. Georg Honigmann. Leipzig: Felix Meiner, 1924. Pp. 319.

LECTURES ON PATHOLOGY. (Delivered in the United States, 1924.) By Ludwig Aschoff, M.D. With Thirty-five Illustrations. New York: Paul B. Hoeber, Inc., 1924. Pp. 365.

MANUAL OF PSYCHIATRY. For the Medical Student and General Practitioner. By Paul E. Bowers, M.S., M.D. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 365.

BIRTH, STILLBIRTH, AND INFANT MORTALITY STATISTICS. For The Birth Registration Area of the United States. 1922. Washington: Department of Commerce, Bureau of the Census, 1924. Pp. 419.

ESSAYS AND ADDRESSES ON DIGESTIVE AND NERVOUS DISEASES AND ON ADDISON'S ANEMIA AND ASTHMA. By Arthur F. Hurst, M.A., M.D., Oxon, F.R.C.P. New York: Paul B. Hoeber, Inc., 1924. Pp. 306.

LOVE IN CHILDREN AND ITS ABERRATIONS. A Book for Parents and Teachers. By Oskar Pfister. Translated from the German by Eden and Cedar Paul. New York: Dodd, Mead and Company, 1924. Pp. 576.

CLINIQUES DERMATOLOGIQUES. Professées dans les Hôpitaux de Paris (La Rochefoucauld—Broca-Pascal—Saint-Louis) et la Faculté de Médicine de Strasbourg. Par Dr. L. Brocq. Paris: Masson et Cie, 1924. Pp. 739.

THE GOLD HEADED CANE. By William MacMichael, M.D. With an Introduction by Sir William Osler, Bart., M.D., F.R.S. and a Preface by Francis R. Packard, M.D. New York: Paul B. Hoeber, Inc., 1925. Pp. 261.

THE ECONOMY OF HUMAN ENERGY. By Thomas Nixon Carver, Ph.D., LL.D. The Citizen's Library of Economics, Politics, and Sociology. Edited by Richard T. Ely, Ph.D., LL.D. New York: The MacMillan Company, 1924. Pp. 287.

SAMMLUNG ZWANGLOSER ABHANDLUNGEN AUS DEM GEBEITE DER VERDAUUNGS—UND STOFFWECHSEL-KRANKHEITEN. Herausgegeben von Prof. Dr. H. Strauss. Band IX, Heft I, Enterogene Entstehung der Magen-und Zwölffingerdarm-Geschwüre.

OUR PHANTASTIC EMOTIONS. An Attempt to Suggest a Fresh Standpoint from Which to Review Human Activities. By T. Kendrick Slade, B. Sc. With a Foreword by Dr. S. Ferenczi. London: Kegan Paul, Trench, Trubner and Company, Ltd., 1923. Pp. 179.

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that tend to linger and fail to respond to remedies usually employed, almost always owe their persistence to inability of the body to restore a physiologic balance. Restorative and reconstructive treatment is essential and the ideal remedy is

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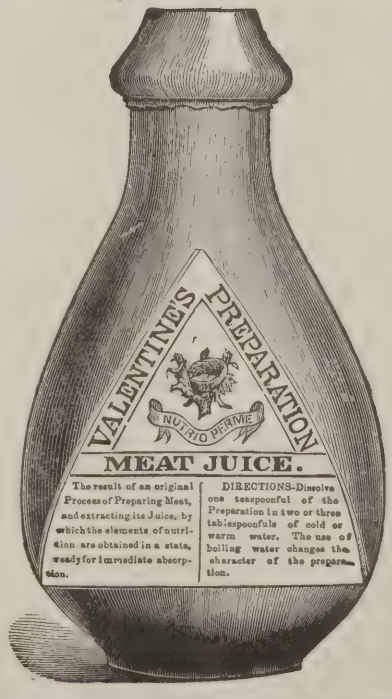
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Miscellany.

Deaths of Physicians in 1924.—During 1924, the deaths of 2,486 physicians in the United States were recorded in the *J. A. M. A.* Adding to that number two per cent. on account of delayed reports and possible omissions, we estimate the total number of deaths during the year at 2,536. On the estimate of 145,966 physicians in the United States, the number in the American Medical Directory, this is equivalent to an annual death rate of 17.37 per thousand. The death rate for 1923, according to *The Journal's* computation, was 17.95 per thousand, and the average for the last twenty-three years has been 16.94.

Ages.—The age at death of the 2,448 whose age was stated varied from twenty-two to ninety-nine years. Twenty-seven of the decedents were under thirty years of age; 113 were between thirty-one and forty; 331 between forty-one and fifty; 597 between fifty-one and sixty; 671 between sixty-one and seventy; 483 between seventy-one and eighty; 205 between eighty-one and ninety, and twenty-one between ninety-one and ninety-nine. The largest number of deaths at any given age occurred at sixty-five years.

Causes of Death.—Of the 2,433 deaths for which the causes were given, diseases of the circulatory system accounted for 893, the largest number. Some form of heart disease accounted for 518, and of these angina pectoris was specified in seventy; myocarditis in sixty-two; valvular disease in twenty-four; endocarditis in sixteen, and acute dilatation in fourteen. Cerebral hemorrhage accounted for 294 deaths, and was the second most frequent cause given. Diseases of the respiratory system caused 248 deaths, and of these 219 were due to pneumonia, six to influenza, and five to pulmonary edema. Diseases of the genitourinary system caused 165 deaths, of which number 117 were reported as due to nephritis and thirty-seven to uremia. Diseases of the digestive system caused 130 deaths, the largest number ascribed to one cause being thirty-two for appendicitis, then cirrhosis of the liver, twenty; peritonitis, seventeen; duodenal ulcer, thirteen, and gastric ulcer, ten. Of the 328 deaths due to so-called general disease, 138 were due to cancer, the organs most frequently affected being the stomach (twenty-one); intestine (sixteen); liver (ten); bladder (nine). Among the general diseases, tuberculosis was the second most frequent cause of death given with fifty-nine; then septicemia, thirty-nine; diabetes mellitus, thirty-five, and leucemia, ten. Diseases of the nervous system caused sixty-two deaths, twenty-eight of which were due to some form of paralysis; nine to meningitis; six to epidemic (lethargic) encephalitis; six to brain tumor, and four to some type of insanity. Seventy-nine deaths followed surgical operations. Five deaths were ascribed to fractures; four to carbuncles; six to aneurysm; ten each to thrombosis and embolism, and fifty-four to arteriosclerosis. For fifty-three deaths, no cause was reported.

Accidents and Homicides.—The causes and distribution of the 102 deaths due to accidents were: automobile, fifty-five; drowning, eight; falls, eight; firearms, five; grade crossings, four; poison, three; asphyxiation, three; street car, three; lightning, aeroplane, gas, phenol (carbolic acid), horse, and the roentgen ray accounted for the remainder. There were thirteen homicides, all due to firearms, and five of these physicians were killed by bandits.

Suicide.—Forty-five physicians ended their lives by suicide; twenty-eight, with firearms; five, poison; two jumping from high places; two, morphin; one, gas; one, hanging; one, chloroform, and in five instances the method was not reported.

Civil Positions.—Among the decedents, fifteen had been members of state legislatures; forty-six, members of boards of education; thirty-eight, members of boards of health; twenty-three, mayors of cities; twenty-one, coroners; fifteen, members of boards of medical examiners; thirteen, authors; four, lawyers; forty, druggists; 103, Civil War veterans; twenty-one, Spanish-American War veterans; 120, World War veterans; ten, bank presidents; two, judges, and one, a missionary.

Association Officers.—Two physicians who died in 1924 had been President of the American Medical Association; two, vice president; one, a member of the House of Delegates, and two, officers of sections. Eighteen had been president of state medical societies.—*J. A. M. A., January 10, 1925.*

To Promote Interchange of Health Authorities.—Interchange of the Public Health Officials of different nations is planned by the Health Committee of the League of Nations, according to a report to be filed with the Council of the League, a copy of which has just reached this country.

The first interchange this year will take place in March in Great Britain, where public health officials from several nations will spend seven weeks. The second interchange will take place in Belgium in May, and the third later in Yugoslavia. The Yugoslavian Government has offered to pay the traveling expenses of all who are the participants of this interchange.

The Japanese Government is making an arrangement for a similar interchange in Japan in the fall to coincide with the meeting of the Far Eastern Association of Tropical Medicine.

Other interchange plans are also under way; one for specialists and factory inspectors, and one for public health officers who have specialized in the protection of maternity and child welfare.

The value of this international cooperation in the improvement of public health has been so generally appreciated by the members of the League of Nations that the Assembly has tripled its appropriation for the work in the current year.

When the interchange conferences are held in highly developed countries like England or Belgium, it means that health officers from the more backward countries are given an opportunity to study the best practice of modern hygiene. When, on the other hand, the interchange is held in one of the old but less modern countries like Czechoslovakia, it means that the local health organization, which is just being organized, has the benefit of the advice and suggestion of the visiting health officers of the more highly developed countries.

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often causes extreme suffering and jeopardizes the efforts of the most skillful surgeon. The anesthetic, the shock of the operation, and in many instances the use of drastic cathartics before the operation, often produce almost complete paralysis of the bowel muscles. Peristalsis ceases and the fecal retention that follows, with the incidental formation of gas, invariably gives rise to severe pain and distress.

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Methods of Determining Extent of Thyroid Enlargement.—Dr. Robert Olesen, of the United States Public Health Service, conducted a thyroid survey of 47,493 elementary school children in Cincinnati last year. In presenting the results of this survey he says that the determination of the extent of thyroid enlargement is a matter requiring considerable practice as well as judgment. When the involvement is pronounced, there is little difficulty in classifying the relative degree of increase in accordance with prearranged arbitrary standards. When the degree of involvement is relatively slight, however, it is sometimes difficult to judge the matter accurately. Many methods of procedure have been advised by workers who are familiar with the subjects, and some of these are well worth recounting briefly.

Hertzler says that "ordinarily in average necks the normal thyroid gland is just palpable to experienced hands. If easily palpable, it is probably slightly enlarged. If palpable in a plump patient, it may be regarded as being enlarged. Often an increase in consistency is as valuable as evidence as increase in volume. Increase of sensitiveness, likewise, may be evidence of increased activity. During pregnancy these statements must be modified, for during this state not infrequently the thyroid gland is easily palpable in the normal state." Cabot maintains that the normal thyroid can rarely be felt.

The following procedure is recommended by Boothby: "To palpate the thyroid, grasp the right lobe with the left hand, thumb in front and fingers sinking in behind the posterior surface by approaching from behind the posterior border of the sternocleidomastoid muscle. By this method the anterior-posterior diameter can be quite accurately estimated and, by moving the hand up and down, the length of the gland can be determined. If an adenoma is present, it may frequently be sufficiently elevated out of the thoracic strait by instructing the patient to swallow so that the thumb and fingers can be slipped in beneath the tumor. The examination is facilitated by pressure of the other hand on the opposite side, pushing the gland and trachea towards the side being palpated."

When the presence of thyroid enlargement has been determined, it is necessary to use some means of comparative record. Mensuration is employed by many authorities, but is unsatisfactory because of the varying shapes of necks and the difficulty of placing the tape in the same position each time a measurement is taken. Hertzler believes that one does as well to employ more general terms, such as "palpable," to indicate the normal, "easily palpable," to indicate suspected enlargement, and "small," "medium," or "large" to indicate appreciable size.

Should mensuration be deemed desirable, the scheme devised by McCarrison offers a simple and efficient method. He advises that "in estimating the increase in size of the thyroid by measurement of the circumference of the neck, it is well to be aware of the fact that, in the absence of other factors, an increase of threefourths to one inch will represent a doubling of its volume, a further increase of threefourths to one inch a trebling, and a still further increase of onehalf to threefourths inch a quadrupling of the gland's volume. These figures are approximately correct for necks whose normal circumference is thirteen to sixteen inches."

In the Cincinnati survey it was the practice to view the side of the neck of each child in a good light. If the neck line was straight and the fullness peculiar to slight isthmial thickening was lacking, thyroid enlargement was presumably judged to be absent. However, before a final decision was made, the region of the usual isthmial location, namely, across the second and third, and, occasionally, the fourth ring of the trachea, was palpated by approximating the palmar surface of the middle finger. By a gentle up and down movement the isthmus can usually be felt and a decision made as to whether the thickening is sufficiently great to be recorded. With the finger still in position the child is asked to swallow, thereby causing the isthmus to be brought into bold relief beneath the finger. In very many instances the extent of isthmial enlargement may be determined by simple observation of the neck while the child swallows.

The Probability of Dying Eventually from Certain Diseases.—The right attitude toward the leading causes of death cannot be assumed from the published figures of crude deathrates. A better way of determining the emphasis upon research and upon organized effort for the control of the causes of human mortality is to find out how much the important diseases or conditions tend to curtail the life span of persons in the productive ages. This can be done only when adequate life table material is prepared from the crude published mortality data.

On this newer basis, heart disease leads the list of causes of death among males and females. The second disease, in point of its probability of terminating life, is chronic nephritis among males and cerebral hemorrhage among females. The disease next in order is cerebral hemorrhage for males and cancer for females. Cancer is in the fourth rank as a cause of death of males and chronic nephritis occupies this rank among females. Tuberculosis is fifth both among males and females. Lobar and bronchopneumonia are sixth and seventh in order, respectively, for both males and females.

The effort at present expended upon the study of heart, arterial, renal and malignant diseases, is insufficient compared with the amount of suffering, disability and death occasioned each year by these diseases. A program for the control of these conditions ought to be drawn on a scale commensurate with the nature and size of the task facing the newer public health movement. Further work is under way in this office with respect to the biological aspects of the chief causes of death, the distribution over the life span of the budget of deaths for given diseases and conditions in a life table generation, the concentration or dispersion of mortality over the ages of active, working life, the extent to which the burden of several causes of death at various age ranges has shifted, and the rise in importance of certain diseases or conditions, and the decline for others. The life table is a powerful tool of analysis of the chances of death, and such analysis leads to altered conceptions of the task facing the life conservation movement of the future. (*Statistical Bulletin,* Metropolitan Life Insurance Company, December, 1924.)

In recommending an infant food —consider its nutritive value first

Cleanliness, digestibility, and palatability are also of importance, but without nutritive value any food would be useless as a body builder.

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Specialism.—Within the last few years the process of the division of labor has been proceeding apace in medicine and surgery, says the editor of the *Medical Press and Circular,* January 7, 1925. This is sufficiently attested by the fact that the Royal Society of Medicine already numbers twenty odd sections. No one can doubt that this differentiation is all for the good of medicine and surgery, for it is obvious that if a doctor devotes special attention to one branch of his profession, and is constantly observing and treating patients suffering from a special class of disease, he must be in a better position to acquire skill in their diagnosis and treatment than if he devotes himself to general medicine, general surgery, or general practice. In order to achieve a tithe of what is expected of him the general practitioner would need to be chosen from the very élite of the profession.

This process of differentiation is a natural and healthy one, and is indeed an essential feature of evolution. The danger the specialist has to guard against is a tendency to exaggerate the importance of his special branch, and to regard it as the most important of all branches of the healing art—that to which all others are subsidiary. This danger is well recognized, but for all that it is not always avoided.

The writer goes on to say that if he were asked to state the relative importance of the different forms of specialism in our profession, he would have no hesitation in placing preventive medicine—eugenics and hygienics—first. To two other branches would be given a foremost place, namely, disorders of the digestive system and gynecological disorders.

Four Decades of Progress in Diphtheria Control.—The deathrate from diphtheria has responded quickly to the medical discoveries which have been made during the past thirty years for the control of this disease. The first significant contribution of medical science to the control of this important menace to child life was Von Behring's discovery of antitoxin. In the period immediately following the general introduction of this adjunct in the treatment of diphtheria, 1894 to 1905, the deathrate in twenty-three American cities declined at a rate of 10.4 per cent. a year. Then there came a period of diminishing returns. Between 1905 and 1918, the rate declined only on the average of 2.8 per cent. a year. This was about the same rate of decline which prevailed during the decade immediately preceding the discovery of antitoxin.

In 1918, however, the new era of Schick testing and the administration of toxin antitoxin began, and with it there set in a further acceleration in the rate of fall of the diphtheria deathrate. During the period 1918 to 1923, the diphtheria rate fell on the average of 10.3 per cent. per year.

The diphtheria prevailing during the past six years in these twenty-three American cities exhibits also a new characteristic in the natural history of the disease. Under former conditions, the diphtheria deathrate tended to rise and fall in three or four year cycles. During the past six years, the deathrate has declined almost by uniform annual decrements. In fact, if the prevailing rate of fall continues in the immediate future, we may expect a negligible diphtheria deathrate in the year 1930. (*Statistical Bulletin,* Metropolitan Life, December, 1924.)

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

MARK ONLY. By T. F. Powys. New York: Alfred A. Knopf, 1924.

PREJUDICES. Fourth Series. By H. L. Mencken. New York: Alfred A. Knopf, 1924.

PRINCIPLES OF PSYCHOLOGY. By J. R. Kantor. New York: Alfred A. Knopf, 1924. Pp. 473.

HISTOIRE DE LA SECRETION GASTRIQUE. Par M. Loeper. Paris: Masson et Cie, 1924. Pp. 120.

LES DYSTROPHIES DE L'ADOLESCENCE. Etudes cliniques. Par V. Hutinel. Paris: Masson et Cie, 1924. Pp. 232.

LECCIONES DE CLINICA MEDICA. (1924.) Por Juan Raul Goyena. Buenos Aires: Pedro Garcia, 1924. Pp. 399.

LOCAL ANESTHESIA SIMPLIFIED. By John Jacob Posner, D.D.S. With fifty-five Illustrations. St. Louis: the C. V. Mosby Company, 1924. Pp. 114.

PEDIATRICS. By Various Authors. Edited by Isaac A. Abt, M.D. Volume V. With 375 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 865.

PHYSIOTHERAPY IN GENERAL PRACTICE. And for the Use of Masseuses. By E. Bellis Clayton, M.B., B.Ch. (Cantab). New York: William Wood and Company, 1924. Pp. 174.

LES HEPATITIES DYSENTERIQUES ET LEUR TRAITEMENT. Par. A. Valassopoule et Pavlos Petridis. Preface du Dr. E. Rist. Avec Figures. Paris: Masson et Cie, 1924. Pp. 143.

DEBATE ON PROHIBITION. Clarence Darrow versus the Rev. John Haynes Holmes. Introduction by The Hon. Royal S. Copeland. New York: The League for Public Discussion, 1924. Pp. 74.

PRACTICE OF PEDIATRICS. By Charles Gilmore Kerley, M.D., and Gaylord Willis Graves, M.D. Third Edition, Revised and Reset. With 150 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 922.

STATE OF NEW YORK.—Forty-second Annual Report of the State Department of Health, for the Year Ending December 31, 1921. Vol. II, Division of Vital Statistics. Legislative Document (122), No. 27. Albany, 1924. Pp. 445.

REPORT OF THE SCIENTIFIC RESEARCHES ON THE VENEREAL DISEASES. United States Interdepartmental Social Hygiene Board, The American Social Hygiene Association. New York: American Social Hygiene Association, 1924. Pp. 71.

DISEASES OF THE HEART. By Dr. Henri Vaquez. Translated and Edited by George F. Laidlaw, M.D. Introduction by William S. Thayer, M.D., F.R.C.P.I. (Hon.). Illustrated. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 743.

THE DEBT OF SCIENCE TO MEDICINE. Being the Harveian Oration, delivered before the Royal College of Physicians of London on St. Luke's Day, 1924. By Archibald E. Garrod, K.C.M.G., D.M., LL.D., F.R.S. Oxford: The Clarendon Press, 1924. Pp. 30.

SPACE, TIME, MOTION. An Historical Introduction to the General Theory of Relativity. By Professor A. V. Vasiliev. Translated from the Russian by H. M. Lucas and C. P. Sanger. With an Introduction by Bertrand Russell, F.R.S. New York: Alfred A. Knopf, 1924. Pp. 232.

PRACTICAL MEDICINE SERIES. Under general editorial charge of Charles L. Mix, A.M., M.D. Volume I: General Medicine. Edited by George H. Weaver, M.D., Lawrason Brown, M.D., Robert B. Preble, A.M., M.D., Bertram W. Sippy, M.D., and Ralph C. Brown, B.S., M.D. Volume II: General Surgery. Edited by Albert J. Ochsner, M.D., F.A.C.S. Series 1924. Chicago: The Year Book Publishers, 1924. Pp. 736, 706.

Coughs and Colds

that tend to linger and fail to respond to remedies usually employed, almost always owe their persistence to inability of the body to restore a physiologic balance. Restorative and reconstructive treatment is essential and the ideal remedy is

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Miscellany.

A New Scientific Journal.—Announcement is made by the National Research Council that the Rockefeller Foundation has appropriated $350,000 to finance a new scientific periodical to be known as *International Biological Abstracts.* The object of this periodical is to give in condensed form a monthly summary of all publications in the fields of botany, zolobacteriology and kindred subjects. There are at present two similar but smaller journals covering parts of the field, *Botanical Abstracts,* and *Bacteriological Abstracts.* The new periodical will absorb and replace these, and in addition cover scientific territory at present not taken care of. The expenditure of the $350,000 initial endowment will take care of editorial and office expenses for ten years, so that subscriptions will need to support only the actual costs of printing and distribution. Publication will begin in January, 1926.

Carrier of Plagues.—Spread of plagues into regions as yet free from them is a danger that threatens with the increased use of airplanes in long distance traffic, according to Air Commodore David Munro, of the British air service. In his presidential address to the Society of Medical Officers of Health, Commodore Munro pointed out that though there is at present no yellow fever in India, the species of mosquito instrumental in its spread is abundant, and that it would require only one fever patient to start an epidemic there. Similarly, an air borne victim of sleeping sickness from Africa might start the disease in some other tropical region at present unvisited with this scourge. At present, with the bulk of travel carried in steamers, quarantine rules are comparatively easy to enforce, but the development of air traffic wipes out sanitary frontiers as effectively as it does military ones.

Smallpox and Vaccination.—In the February 2nd issue of *Health News,* the New York State Department of Health publishes statistics, compiled by the Division of Communicable Diseases, which illustrate in a vivid manner the relation of vaccination to the prevention of smallpox.

The average morbidity rate for smallpox in the State, exclusive of New York City, in the years 1914-1924, inclusive, was 7.6 in 100,000 population. Under the existing law vaccination is a prerequisite to school attendance in first and second class cities only. A larger proportion of the populations of these cities has therefore been vaccinated than in the rest of the State. In first and second class cities, the average rate for smallpox was only 3.1 in 100,000 as compared with a rate of 9.6 in the rest of the State. It is quite certain that the difference would have been even more marked had there not been a laxity in past years in enforcing the vaccination law in private schools located in first and second class cities.

Other evidence of the efficacy of vaccination is furnished by the vaccination histories which were obtained in 487 out of the 488 cases reported in 1924. Of these, 451 had never been vaccinated, 33 were vaccinated more than seven years previously, two had been vaccinated six or seven years previously, and one was vaccinated in 1922. While it is not possible in the State as a whole to obtain figures showing the relative attack rate among unvaccinated persons as compared with those who have been vaccinated, general knowledge as to the large proportion of people who have at some time been vaccinated makes the above findings most significant, especially when the difference between the rates for first and second class cities and for other places is taken into consideration.

The fact that three individuals contracted the disease despite their having been vaccinated within seven years, again reminds us that there is nothing sacred about the number seven in connection with vaccination. As will be noted, one individual had been vaccinated two years before and yet contracted smallpox. The only safe way is to be revaccinated with potent virus until only an immune reaction results.

The Danish Gold Treatment of Tuberculosis.—Hardly a year passes but announcement is made of some new method of treating tuberculosis. The hope that springs eternal in the breast of the consumptive is stimulated again, only to end in the apparently inevitable disappointment that has ensued so frequently. The most recent method to receive the sensational publicity duly accorded any venture in the treatment of tuberculosis is a preparation of gold, advanced in Denmark under the name "sanocrysin." As reported in the *Ugeskrift for Læger,* meetings were held in Copenhagen, October 28th and 29th at which investigators of the new remedy gave their results to the Danish medical profession. Professor Moellgaard, the originator of the remedy, described its production, and stated that no reaction follows the introduction into the body of this remedy by the intravenous method, provided the tissues are healthy; but if they are tuberculous, a violent reaction ensues. It is assumed that the reaction is the result of the release of material from tubercle bacilli that are destroyed by the remedy. The reaction is opposed by the injection of a specially prepared horse serum which, Moellgaard believes, already has greatly reduced the severity of the phenomena of the reaction. At the conference in Copenhagen, Moellgaard described the complete clinical recovery of two monkeys with severe tuberculous infection, following the use of his method. Several well known Danish clinicians reported brilliant results in the cases of many patients. However, there were several instances in which death had followed the administration of the remedy, presumably on account of difficulty in determining accurately the proper dose. In discussing this work, the *British Medical Journal* points out that the most cautious of the speakers was Professor Moellgaard himself, and that he had been exceedingly reserved in his forecasts of the efficacy of "sanocrysin." In any event, it is also reported that Professor Moellgaard has asked the Medical Research Council of Great Britain to organize an investigation of the properties of the remedy. No doubt, information will become available in the near future which will indicate more adequately whether or not the drug has any real virtues in a condition in which heretofore all remedies heralded as specific have failed.—*J. A. M. A.,* December 13, 1924.

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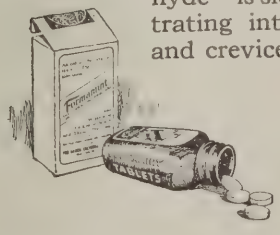

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Infantile Paralysis.—More than eight hundred cases of infantile paralysis, many of which occurred in adults, were reported to the State Department of Health last year according to Dr. LeRoy W. Hubbard, orthopedic surgeon of that department. He states further that altogether during the past four years over two thousand known cases of this disease have occurred and he estimates that there have been as many more so mild as not to have been recognized.

International Cancer Commission.—A commission to study cancer, composed of international medical authorities, has been appointed by the Health Committee of the League of Nations. The commission will consist of Sir George Buchanan as chairman, and Dr. Lutrarie, an Italian; Dr. Jitta of the Netherlands, Professor Leon Bernard and Dr. Carriere of France.

The first work of the commission will be a comparison of the statistics of Great Britain, Italy and the Netherlands relating to the cause of the difference shown to exist between the cancer mortality of these countries. The Cancer Commission was further empowered to extend its investigations into the epidemiology of cancer in general as far as possible.

So far European medical authorities have discovered that there is more cancer in England than in Italy and that there seems to be an inverse relation between cancer and birth rate. This hypothesis seems to be borne out by the fact that in the United States women of Italian birth, according to Dr. Eichel, have more children and less cancer than women from the British Isles.

Strong as a Horse.—This expression, spoken admiringly of a mighty athlete, is not so great an exaggeration as it sounds. Exact studies of the physical exertion put forth by the members of the famous Yale crew of 1924 by Dr. Yandell Henderson and Dr. Howard W. Haggard of the department of applied physiology at Yale, show that each man developed, during the period of a race, about one half horsepower.

Determinations of energy expended were obtained in various ways. The men were exercised individually on rowing machins with power meters attached; the ratio of oxygen taken in to carbon dioxide given off in breathing was determined; the racing shell they used was towed by a power boat with a spring balance set into the towline. "The data from these three methods were in general in fair agreement," says Dr. Hendrson. "They indicate that the maximal power exerted is from .45 to .55 horse power a man, or expressed in the heat equivalents, 4.8 to 5.9 calories a minute, with a total energy expenditure of 19 to 29 calories a minute, or thirteen to twenty times the basal rate."

It was noted that these athletes did not puff and blow noticeably, however great their exertion, which is in marked contrast with the distress of untrained or half trained men. The amount of oxygen they took in through their lungs reached about the limit of the carrying power of heart and blood; yet it was not sufficient to replace the amount burned up during the race. As Dr. Henderson expresses it, "He draws heavily on his credit and incurs oxygen deficits; these deficits are repaid by the high rate of oxygen absorption for a time after the work is ended."

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

PLUMES. By Laurence Stallings. New York: Harcourt, Brace and Company, 1924. Pp. 348.

SÊMIOLOGIE OCULAIRE. Le Diaphragme. Irido-Ciliaire. Par F. Terrien. Paris: Masson et Cie, 1924. Pp. 234.

TANTALUS or The Future of Man. By F. C. S. Schiller, M.A., D.Sc. New York: E. P. Dutton and Company, 1924. Pp. 66.

WEBER AND FIELDS. Their Tribulations, Triumphs and Their Associates. By Felix Isman. New York: Boni and Liveright, 1924. Pp. 345.

PRÉCIS DE CLINIQUE DÉMIOLOGIQUE. (Diagnostics, Prognostics et Traitement.) Par Gaston Lyon. Paris: Masson et Cie, 1924. Pp. 717.

THE DISTRIBUTION OF PHYSICIANS IN THE UNITED STATES. By Lewis Mayers and Leonard V. Harrison. New York: General Education Board, 1924. Pp. 197.

WELLCOME PHOTOGRAPHIC EXPOSURE CALCULATURE, HANDBOOK AND DIARY, 1925. New York: Burroughs Wellcome and Company (U. S. A.) Inc., 1924.

PHYSIOLOGICAL PRINCIPLES IN TREATMENT. By W. Langdon Brown, M. A., M. D., Cantab., F. R. C. P. Fifth Edition. New York: William Wood and Company, 1925. Pp. 511.

THE ADVANCE OF ORTHOPEDIC SURGERY. By A. H. Tubby, C.B., C.M.G. Illustrated. Reprinted from *The Clinical Journal*. London: H. K. Lewis & Co., Ltd., 1924. Pp. 144.

TEXTBOOK OF PATHOLOGY. By William G. MacCallum, M.D. Third edition, revised. With 575 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 1162.

A MANUAL OF OBSTETRICS. By John Cooke Hirst, M.D. Second edition, reset. With 229 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 551.

METHODS AND PROBLEMS OF MEDICAL EDUCATION. (Second Series). By Division of Medical Education, the Rockefeller Foundation. New York: The Rockefeller Foundation, 1924. Pp. 118.

MANUAL FOR DIABETICS. By Gladys L. Boyd, M. D., (Tor.), and Marion D. Stalsmith. Introduction by F. G. Banting, M. D. New York and London: Funk & Wagnalls Company, 1925. Pp. 90.

OPERATIVE SURGERY. By Warren Stone Bickham, M.D., F.A.C.S. Volume VI, with 1224 Illustrations. General Index, Volumes I to VI (189 pages). Philadelphia and London: W. B. Saunders Company, 1924. Pp. 989.

THEORY AND PRACTICE OF THE STEINACH OPERATION. With a Report on One Hundred Cases. By Dr. Peter Schmidt (Berlin) and an Introduction to the English Edition by J. Johnston Abraham. London: William Heinemann (Medical Books) Ltd., 1924. Pp. 150.

THE PNEUMOCOCCUS AND PNEUMOCOCCAL AFFECTIONS. By L. Cotoni, C. Truche and Mlle. A. Raphael. English Edition by D. S. Page, M.A., M.D. (Cantab.), and Eva Morton, M.R.C.S., Eng. With Numerous Figures and Charts. London: John Bale, Sons & Danielsson, Ltd., 1924. Pp. 218.

PRACTICAL LECTURES. Delivered under the Auspices of the Medical Society of the County of Kings, Brooklyn, New York. 1923-1924 Series. One hundred and thirty-two illustrations and three color plates. New York: Paul B. Hoeber, Inc., 1925. Pp. 484.

RHEUMATIC HEART DISEASE. By Carey F. Coombs, M. D., F. R. C. P. Lond. With an Introduction by F. J. Poynton, M. D., F. R. C. P. Lond. With Numerous Original Plates and Illustrations in the Text. New York: William Wood and Company, 1924. Pp. 376.

Coughs and Colds

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Miscellany.

Periodicity, Affinity, and Antagonism.—The periodicity of disease is no new theory, and the remarkable cyclical character of influenza to which attention has recently been drawn, is but another exemplification of its reality. The present epidemic began during the first week in January—twice thirty-three weeks from the beginning of the epidemic of October, 1923; thrice thirty-three weeks from the beginning of the epidemic of February, 1923; and five times thirty-three weeks from the severe outbreak of the winter of 1921-2. The periodicity is exact, but incomplete. During the last few years, at least, this phenomenon has characterized influenza, but it is as yet unaccounted for.

The history of epidemics shows that they have a tendency to stamp their peculiar features upon other forms of contemporary disease. When diphtheria or scarlet fever is prevalent, nonspecific sore throats are common; when cholera or typhoid is epidemic, nonspecific enteritis increases. The toxicity of the bacillus appears to be diminished in some cases by an antitoxin, which prevents specific infection, but allows of irritation of those very tissues for which the bacillus shows its predilection. The eclectic habit of the bacillus is not understood. Why does diphtheria choose the tonsil? Why typhoid the intestine? The field of thought which is opened up by these questions is very wide; and there is another closely related problem which still more gravely concerns us.

The bacillus of influenza is suspected by many to be concerned in the production of the syndrome known as encephalitis lethargica; and its complicity in the recent outbreaks of pneumonic plague in China, Northern Africa, and California, is well nigh certain. The presence of influenza in each of these countries was already recognized, when suddenly cases occurred in which, instead of pursuing the ordinary course, septic pneumonia rapidly produced a fatal issue. It was pneumonic plague. The mortality was almost cent. per cent., and the infection, spread probably by droplets of expired air, was of extreme virulence. The bacillus of influenza appears to have been powerful enough to induce its comrade of plague to concentrate upon the lung, with results so speedily fatal that bubonic infiltration had not sufficient time to develop. The natural resistance of the individual infected would have been sufficient, in at least some cases, to overcome the onslaught of either influenza, or plague, singly; but in combination the attack upon the lung was irresistible.

To us sleeping sickness is a new disease; probably it is due to some change in the elective affinity of the bacillus; but the causative factor, like that of most new diseases other than those of occupation, is undiscovered.

The historian of medicine, puzzled to account for the absence of traces of syphilis from the disinterred bodies of the ancient Egyptians, and indeed from the whole of the Old World previous to the very end of the fifteenth century, seeks from the study of the evolution of disease and the changes which it undoubtedly undergoes in consequence of external social conditions, an explanation of the disappearance of leprosy and the contemporaneous rise of syphilis. If the recent outbreaks of pneumonic plague were due to the alliance of the bacilli of influenza and plague, is it not permissible to assume the occasional antagonism of other forms, and the consequent defeat and disappearance of one of the contestants? Were they to meet in the ring today, what would be the result of the struggle between the bacillus of leprosy and the spirochæte?—(*Medical Press and Circular,* February 24, 1925.)

Type Specimens of All Bacteria to Be Preserved at McCormick Institute.—A museum containing a complete collection of living disease germs, as well as useful bacteria, is to be established at Chicago. Such a comprehensive collection of type cultures will be to the bacteriologist what the herbarium is to the botanist. The herbarium enables the botanist to identify his plants by comparing them with the dried specimens. The type collection serves not only to identify new cultures by comparison with authentic ones, but since they are living cultures they can be used by investigators, manufacturers of biological products, clinicians, and others who want a particular organism for a special purpose.

For many years what was known as the Kral collection was maintained in Germany by private enterprise, but this has not been available since the beginning of the war. More recently the British Medical Research Council has established a type collection at the Lister Institute and in Holland there is a collection of fungi. The American Museum of Natural History established a collection of bacterial type cultures under the direction of Dr. C. E. A. Winslow, curator of public health. This was maintained for some time after Dr. Winslow severed his connection with the museum, but the necessity for curtailing expenses finally obliged them to abandon this activity. The collection was taken over by the Society of American Bacteriologists which maintained it at the Army Medical Museum in Washington. Owing to the limited funds available it was only possible to carry a limited number of bacteria and no attempt was made to include molds, fungi, or other microorganisms. In the meantime, the National Research Council was endeavoring to find some permanent source of support for the collection and finally the General Education Board recognizing the value of a collection of this kind to medical schools and other institutions teaching bacteriology, made a grant of $24,000 to support the collection for five years.

Under this arrangement the collection will be maintained at the McCormick Institute at Chicago, of which Dr. L. Hektoen is director. The general management of the collection will be vested in a committee representing the Society of American Bacteriologists, the Society of Bacteriologists and Pathologists, the American Phytopathological Society, the American Society of Zoologists, and the McCormick Institute. The chairman of the committee is Dr. L. A. Rogers of the United States Department of Agriculture.

It is proposed to enlarge the scope of the collection as much as the funds available will permit. It will include not only the pathogenic bacteria, but also bacteria causing plant diseases, those used in dairying and the fermentation industries, soil and nitrogen fixing bacteria. A limited number of molds and fungi may be added and eventually the collection may include some of the protozoa or animal forms.

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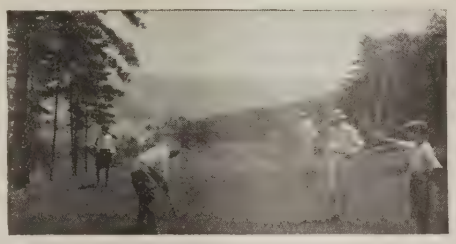

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The Stigma of Neurosis.—The evolution of official terminology from "madhouse" through "'lunatic asylum" to "mental hospital" shows that there is a great deal in names when they involve prejudice, and any change in nomenclature is justified that helps to remove the notion that the mental sufferer is a guilty encumbrance to be hidden away so that he cannot offend. But the expression of prejudice in names is still current in the sphere of those minor psychoses that rarely involve certification, says *The Lancet,* January 3, 1925. "Shell shock" was a respectable disability, whilst the alternative and correct diagnosis of hysteria was, and often still is, suppressed on account of the attached opprobrium. A patient may have a gastric or vasomotor "neurosis," but he must not be "neurotic" on pain of social or family ostracism and, we fear, some degree of professional neglect. There is, indeed, a distinction between neurotic and neurasthenic which involves a subtle moral judgment. If we accept inquest reports as a basis of observation we find that the sufferer from neurasthenia often commits suicide while the neurotic never does; thus the latter may demonstrate, by suicide, his right to the more respectable diagnosis. The phrase "nervous breakdown," however, involves nothing blameworthy, and a recent lay writer describes under that title the mental trouble from which the elder Pitt suffered, though the description makes clear that the condition was one of anxiety hysteria.

This medley of prejudice and pseudodiagnosis is partly responsible for that astonishing amount of suffering and disability in the domain of the psychoneuroses to which Dr. Edwin Goodall referred in a recent issue of *The Lance*. The obloquy carried by such words as "hysterical" or "neurotic" is accompanied by a belief that the patient is to blame, that he need only use common sense and will power to rid himself of his difficulties, and that neurotic suffering is best treated by "wise neglect." This belief will often be supported by the practitioner who has not followed the progress of psychopathology. It is regarded as a sad injustice when a patient with an organic disability is wrongly thought to be hysterical or neurotic, but, though an error in diagnosis is always regrettable, it is our peculiar attitude towards the neurotic that makes this particular mistake so distressing. Yet the denial of help to the mental sufferer is a greater injustice, and the patient who needs treatment for his mental state is often not even given the opportunity to describe the symptoms for which he would welcome relief.

This same medley is allowed to form the equipment with which many a practitioner, even after holding hospital appointments, sets out to handle the problem of the psychoneuroses in general practice. Systematic instruction in psychopathology hardly exists, though its foundations are now well established, and that it receives little attention in the general curriculum is suggested by the fact that the candidate for a qualifying examination would never expect to be questioned, say, upon that common clinical phenomenon connoted by the phrase "a nervous breakdown." In fact, his hospital training teaches him that all clinical interest ceases when once a diagnosis of neurosis is established. Certainly the neurotic patient seems to have a legitimate grievance, but it is one that bids fair to be removed or alleviated. More instruction is being given today in our medical schools along the indicated lines, as the teachers themselves are becoming more impressed with its necessity. And here we have a direction in which medical training can be improved practically without additions to a crowded curriculum.

School Inspection Started in Panama Canal Zone.—Beginning October 1, 1924, the annual examination of the school children of the Panama Canal was inaugurated. This is the first year that the public schools have had the services of a full time school nurse.

The examination of the school children in the Zone is perhaps done more thoroughly and scientificially than in any city in the United States. After the preliminary weighing and measuring of the child, he is then seen by specialists for the examination of the eyes, ears, nose and throat. The examination is thoroughly done with the use of the ophthalmoscope and other instruments. Next, the child is referred to a physician for the lungs and heart. The examination is made with the child stripped to the waist. In boys, examination is also made for adherent prepuce. A notice is then sent to all parents as to the defects discovered and they are advised to have corrections made at the Ancon Hospital where experts are on duty. During the summer 635 had corrections made, including vision, enlarged tonsils, adenoids and orthopedic defects.

Health centres are in operation where parents can come for further advice relative to their defective children.

Low Mortality Rate in the United States During 1924.—The year 1924 has won the honor of having had the lowest mortality rate ever recorded among the wage earning populations of the United States and Canada. Statisticians of the Metropolitan Life Insurance Company have announced that based upon returns from fifteen million records a substantial decline in death rate as compared with 1923 is assured, although all reports are not yet in.

Heart disease, as in 1923 and 1922, will be the leading cause of death but the mortality, nevertheless, will be much lower than in 1923. Since 1911 there has been a decline of twenty points in 100,000 in the heart disease death rate.

The great health achievement of the year has been the marvelous reduction in the death rate from pulmonary tuberculosis. The rate this year will be slightly over ninety in 100,000 persons exposed. This marks a decline of ten per cent. in one year. In 1911 the rate from this cause was more than twice the 1924 figure.

Pneumonia will be the third cause numerically. For the few diseases that show higher rates of mortality in 1924, either the increase has been small or the diseases themselves are of relatively minor importance numerically.

Present indications are that 1924 will be the first year since the automobile has become a means of transportation that the death rate from its casualties will not increase. Up to December 13th the 1924 rate was identical with that for the same time last year.

In recommending an infant food —consider its nutritive value first

Cleanliness, digestibility, and palatability are also of importance, but without nutritive value any food would be useless as a body builder.

FOR the infant, breast milk furnishes all of the requirements mentioned. There is no need to seek further for a better food because no one has as yet been able to prepare a formula which can be considered anything other than a second choice.

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Death Rate from Cancer Increasing in England and Wales.—Statistics indicate that in these two countries out of each one hundred thousand persons 121 die of cancer. The rate gradually increased, from 0.32 in a thousand in 1851-60 to 1.21 in 1921. To some extent, this fourfold increase is due to the fact that a larger proportion of the population now lives to those ages at which death from cancer most commonly occurs. When allowance is made for this ageing, it appears that the increase recorded has actually trebled.

To what extent the increase is due to improved diagnosis and more accurate reporting has long been a matter of discussion. These factors have been contributory, but they do not account for the whole increase. Superficial cancers, such as those of the tongue and female breast, were readily recognizable even sixty years ago, by the time death occurred. Yet there have been increases of thirty-nine and twenty-eight per cent., respectively, in deaths from cancer in these locations in twenty years. During the same period, deaths from cancer of all forms, collectively, increased by twenty per cent. Only in cancer of the uterus has there been no significant increase.

During the twenty years from 1901 to 1921, in which cancer increased by twenty per cent., the general death rate fell back thirty-two per cent., that of infants by forty-five per cent., and that of tuberculosis by thirty-eight per cent. An increase of mortality attributed to cancer is the common experience of modern civilization. The frequency with which different parts of the body are attacked by fatal cancer differs greatly in different countries. It may differ over a period of years even in the same country. Changes are occurring in the ages at which most of the deaths occur.

In England and Wales the tendency is for the deaths to occur later in life than formerly, and this change has been going on, at least among females, for many years. The latest returns show that the death rate from cancer is not increasing from males up to forty-five years of age, or for females up to sixty. The most rapid increases are in extreme old age. As might be expected, differences in regard to the parts of the body attacked exist between the sexes.

Acute Poisoning Due to Eating the Seeds of the Jimson Weed (Datura Stramonium).—J. A. Garvin (*Archives of Pediatrics*, December, 1923) states that the diagnosis of poisoning due to eating the seeds of the Jimson weed is simple and is made from the widely dilated pupils, high fever, flushed body and wild delirium of sudden onset. The finding of the specific seeds in the vomitus or stools, or the history of having eaten seeds from a pod, confirms the diagnosis. The treatment consists in the prompt removal of the seeds by gastric lavage or emetics, and cathartics. The delirium is best controlled by restraint and an ice cap to the head; the fever by hydrotherapy and the physiological effects of the alkaloid by the hypodermic administration of pilocarpin or physostigmin in the appropriate dose for the age of the patient. Opium or one of its derivatives may be used in the early stages of poisoning, but it is contraindicated if depression occurs.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

TECHNIQUE OF TISSUE CULTURE "IN VITRO." By T. S. P. Strangeways. Cambridge: W. Heffer & Sons, Ltd., 1924. Pp. 80.

TISSUE CULTURE IN RELATION TO GROWTH AND DIFFERENTIATION. By T. S. P. Strangeways. Cambridge: W. Heffer & Sons, Ltd., 1924. Pp. 50.

LOOKING BACKWARD. By George Sterling Ryerson, M. D., C. M., L. R. C. P. and S. Edin., F. A. C. S. Toronto: The Ryerson Press, 1924. Pp. 263.

PHYSICAL CHEMISTRY FOR STUDENTS OF MEDICINE. By Alexander Findlay, M. A., D. Sc., F. I. C. With 39 Figures. London and New York: Longmans, Green and Co., 1924. Pp. 227.

MODERN ASPECTS OF SYPHILIS. By M. J. Horgan, B. A., M. B., B. Ch., B. A. O., N. U. I. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1924. Pp. 136.

SURGICAL PATHOLOGY. By William Boyd, M. D., M. R. C. P., Ed., F. R. S. C. With 349 Illustrations and 13 Colored Plates. Philadelphia and London: W. B. Saunders Company, 1925. Pp. 837.

STEPPE UND MENSCH. Kirgische Reiseeindrücke und Betrachtungen über Leben, Kultur und Krankheit in Ihren Zusammenhängen. Von Max H. Kuczynski. Leipzig: S. Hirzel, 1925. Pp. 188.

DAS ALS-OB IM ÄRZTLICHEN DENKEN. Von Dr. Med. Richard Koch. Bausteine zu einer Philosophie des Als-Ob, Herausgeg. von Dr. Hans Vaihinger u. Dr. Raymond Schmidt. 8 Band. München: Rösl et Cie, 1924. Pp. 102.

L'INNERVATION PÉRIPHÉRIQUE. Par Dr. Emile Villiger. Traduction Française par le Dr. Pierre Hoff. De la 3d Edition Revue et Corrigée, Avec 66 Figures Dans Le Texte. Paris: Librairie le François, 1925. Pp. 214.

ERRINERUNGEN GEDANKEN UND MEINUNGEN. Des Dr. B. Naunyn. Emeritierter Professor der innern Klinik Universität Strasburg. Mit einer Heliogravüre und einer Lichtdrucktafel. München: J. F. Bergmann, 1925. Pp. 571.

WÜRZBURGER APHANDLUNGEN AUS DEM GESAMPTGEBIET DER MEDIZIN. Zur Pathologie und Klinik der Ovarialtumoren. Von Dr. E. Stübler und Dr. Th. Brandess. Neue Folge, Band 1, Heft 9, der Ganzen Reihe 21, Band. Leipzig: Curt Kabitzsch, 1924. Pp. 360.

GYNECOLOGY WITH OBSTETRICS. A Textbook for Students and Practitioners. By John S. Fairbairn, M. A., B. M., B. Ch. (Oxon.), F. R. C. P. (Lond.), F. R. C. S. (Eng.). Oxford Medical Publications. Oxford: Humphrey Milford, Oxford University Press, 1924. Pp. 769.

THE TREATMENT OF FRACTURES IN GENERAL PRACTICE. By C. Max Page, D. S. O., M. S. (Lond.), F. R. C. S., and W. Rowley Bristow, M. B., B. S. (Lond.), F. R. C. S. Oxford Medical Publications. London: Henry Frowde and Hodder & Stoughton, 1923. Pp. 239.

PRACTICAL ANÆSTHETICS. By H. Edmund G. Boyle, O. B. E. (Mil.), M. R. C. S. (Eng.), L. R. C. P. (Lond.), and C. Langton Hewer, M. B., B. S. (Lond.), M. R. C. S. (Eng.), L. R. C. P. (Lond.). Third Edition. London: Henry Frowde and Hodder & Stoughton, 1923. Pp. 187.

ARBEITEN AUS DEM SEXUALPSYCOLOGISCHEN SEMINAR. Von Prof. W. Liepmann, Berlin. Band 1, Heft 2: Sexualpsychologische Studie zur Homosexualität, von Werner Hartoch; Das Weib in Weiningers Geschlechtscharakteriologie, von H. W. Brann. Bonn: A. Marcus und E. Weber, 1924. Pp. 39.

COMMON INFECTIONS OF THE FEMALE URETHRA AND CERVIX. By Frank Kidd, M. A., M. Ch. (Cantab.), F. R. C. S. (Eng.), and A. Malcom Simpson, N. A., M. B., D. P. H. (Cantab.). With additional Chapters by George T. Western, M. D. and M. S. Mayou, F. R. C. S. Oxford Medical Publications. Oxford: Humphrey Milford, 1924. Pp. 191.

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S 13

Miscellany.

The Rivers Memorial Medal.—The council of the Royal Anthropological Institute recently determined to commemorate W. H. R. Rivers, M.D., F.R.S., who was its president at the time of his death, by founding a Rivers Medal, to be given annually for meritorious anthropological work done in the field. The first presentation of the medal took place at a meeting of the institute on January 27th, when the award was made to Dr. Alfred C. Haddon, F.R.S., reader in ethnology in the University of Cambridge, in recognition of his work in New Guinea, Torres Strait, and Borneo. The president of the institute, Professor C. G. Seligman, in presenting the medal (which has been struck by the Royal Mint and bears a bust of Dr. Rivers on the obverse), said that the names of W. H. R. Rivers and Alfred Cort Haddon were closely united in many ways. In honoring both on this occasion anthropologists were praising famous men and—for he might well carry the quotation further—"our fathers that begat us." There was no one who had added anything to the science of anthropology during the last fifteen years who was not indebted to a greater or less extent to one or other or both of these men. They worked together, and personally he had no doubt that neither of them would have achieved what he did had he worked alone. The medallist of that evening, upon whom this honor was most naturally and fittingly bestowed, was the first man to organize a really important anthropological expedition in the field. Every working anthropologist, directly or indirectly, was under obligation to the initiative behind that expedition to the Torres Strait a quarter of a century ago. The expedition proved to be the most important that had ever been organized, and it was a striking proof of Haddon's foresight that he determined that it should be not only an anthropological but a psychological expedition also, and that half of its members should be trained psychologists. The opportunity of that expedition sent the subtle spirit of Rivers roving over that fascinating "no man's land" in which ethnology, psychology, genetics, sociology, and even medicine all interpenetrated. There he experimented to some extent, but more than anything else he speculated, and speculated brilliantly. Professor Seligman added that he had had the privilege of working with Rivers in the field, and he was able to see the very distinct connection between the genealogical method which he hammered out in Torres Strait and the work he did for shell shocked soldiers in the war. After speaking of the work of Dr. Haddon as author and teacher, he said it was with mingled respect and affection and sorrow and pride that he presented the Rivers medal for the first time. Dr. Haddon, in acknowledgment, said that he was very happy to have his name associated with that of his old friend and colleague. After his own first expedition of 1889 he gained an appreciation of the fact that psychology was an integral part of anthropology, and he determined that if he had opportunity in this direction he would not neglect it. When he was preparing for the Torres Strait expedition in 1898 he asked Rivers to join him, and Rivers refused, but later, finding that C. S. Myers and another of his best students were going, he changed his mind and asked to be allowed to join the party. The consequence was that for the first time natives were studied psychologically in their own country by trained psychologists with adequate apparatus.—(*British Medical Journal,* January 31, 1925.)

New Dietary Factor in Pellagra Prevention.—Pellagra, a disease of serious importance in the South, may be prevented by the newly discovered "dietary factor P-P," present in brewers' yeast, fresh milk, and fresh beef. While it may be a vitamine, it is not identical with any of the vitamines hitherto discovered and described. Dr. Joseph Goldberger and Dr. W. F. Tanner, of the United States Public Health Service, discovered this new disease preventing factor while they were at work at the Georgia State Sanatorium for colored women, where many of the inmates were sufferers from pellagra.

Earlier investigators had made frequent statements that peas and beans were pellagra preventives, but Goldberger and Tanner found that even when the patients were given these foods daily in considerable amounts, pellagra still developed. Then they tried fresh milk casein in the form of cottage cheese, and got good results. Dried milk powder, however, failed to have the same preventive power. The best results were obtained with brewers' yeast. Patients receiving daily doses improved more rapidly than those on any other treatment tried. By a comparison of the diets of their patients with those used in treatments and experiments on other deficiency diseases, Goldberger and Tanner were led to the conclusion that none of the known vitamines or dietary factors could account in every case for their results, and that therefore there must be a hitherto unsuspected preventive factor at work.

The Cost of Disease.—It has long been a truism that diseases like tuberculosis and typhoid fever, which kill in young adult life, impose a heavier economic burden than those which affect infants or old people. During the first two decades the family and the community make their investment; during the following forty years they reap the profit.

Freudenberg (*Zeitschrift für Hygiene,* xciii) has recently made an interesting attempt to work this problem out on a more definitely quantitative basis, by computing for Germany the mortality at each age period from each principal cause, and then applying assumed figures for the value of a human life at each age period. The six chief causes of death ranked in actual numerical importance as follows, expressed in percentages of deaths from all causes: diseases of the heart and arteries, 20.9; developmental diseases and malnutrition, 12.8; tuberculosis, 10.5; diseases of the digestive organs, 10.5; tumors, 10.0; pneumonia, 7.7. On the basis of economic cost the indicated relation is very different. Tuberculosis now leads accounting for 22.0 per cent. of the total economic burden of disease; diseases of the heart and bloodvessels come next with 19.3 per cent.; tumors account for 12.6 per cent.; and diseases of the digestive system for 7.0 per cent. Pneumonia falls to 5.3 per cent. and developmental diseases and malnutrition to 3.3 per cent. There is a viewpoint here which may well be taken into consideration in planning the strategy of the public health campaign.—(*The Nation's Health,* February, 1925.)

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Venereal Disease in the United States.—An increase in the number of cases of venereal disease reported in the United States in the year which ended June 30, 1924, over the number reported in the previous corresponding year is disclosed by the figures recently made public in the annual report of the Division of Venereal Diseases of the United States Public Health Service. The report indicates that the increase in the fiscal year 1924 amounts to 27,382 cases, or 7.2 per cent. A total of 363,063 cases of venereal disease were reported to the various state boards of health from all sources. This total was composed of 193,844 cases of syphilis, 160,790 cases of gonorrhea, and 8,429 cases of chancroid.

"The fact that the 1924 statistics show an increase over those for 1923 does not necessarily mean that venereal disease was any more prevalent in the United States last year than in the year before," explains the chief of the Division of Venereal Diseases.

"The greater number of cases now on record at the State boards of health," he continues, "may well be accounted for by the increased efficiency in detecting these maladies and by more conscientious reporting of cases on the part of private physicians. For a long time the danger from syphilis and gonorrhea was greatly enhanced by the fact that these diseases were carefully covered and concealed and were often kept secret even from physicians who might have brought about a cure. Fortunately people are now learning that they must go to a reputable physician or clinic if they wish to be cured, and laws requiring that these cases be reported to the State boards of health are making it possible to obtain some idea as to the prevalence of syphilis and gonorrhea in the country, although there are many cases that still escape discovery.

During the fiscal year just passed, 504 public clinics reported to the State boards. These clinics treated 118,023 new cases of venereal disease made up of 65,046 cases of syphilis, 49,029 cases of gonorrhea, and 3,949 cases of chancroid. A total of 2,147,087 treatments were given. The fact that these clinics made 302,152 Wassermann tests for detecting syphilis and 203,008 examinations to discover gonorrhea would seem to indicate that people are beginning to realize the terrible consequences that follow in the wake of these diseases and are willing to take advantage of reputable opportunities for cure.

Reports from thirty-seven correctional and penal institutions were received by the division. The efforts of those in charge of these institutions have resulted in a large increase in the number of venereally diseased persons discovered and treated. New patients to the number of 7,045 were admitted to treatment in 1924, an increase of forty-four per cent. over the year 1923.

The menace of venereal disease is one that is being fought by the United States Public Health Service and the various State boards of health acting in cooperation with municipal health officers. These governmental agencies are trying to impress upon parents, teachers, young people and others the need of wholesome sex education, of prompt medical attention and the necessity for the passage of modern health ordinances and legislation. Among the social institutions which can aid in this work are the home, the school, the church and the press.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

AN AFRICAN HOLLIDAY. By Richard L. Sutton, M.D., LL.D. St. Louis: C. V. Mosby Company, 1924. Pp. 180.

SPIROCHÉTOSES RESPIRATOIRES STOMATOGENES. Par G. Delamare. Paris: Masson et Cie, 1924. Pp. 143.

BRIDGMAN'S LIFE DRAWING. By George B. Bridgman. First Edition. Pelham: Edward C. Bridgman, 1925. Pp. 169.

CONSTRUCTIVE ANATOMY. By George B. Bridgman. Eighth Printing. Pelham: Edward C. Bridgman, 1925. Pp. 213.

AN INTRODUCTION TO SCHOOL MEDICINE. By H. Leslie Cronk, M.A., M.D. London: H. K. Lewis and Company, Ltd., 1925. Pp. 236.

NUTRITIONAL PHYSIOLOGY. By Percy Goldthwait Stiles. Fifth Edition. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 307.

REJUVENATION. The Work of Steinach, Voronoff, and Others. By Norman Haire, Ch.M., M.B. New York: The MacMillan Company, 1925. Pp. 223.

OPERATIVE SURGERY. By J. Shelton Horsley, M. D., F.A.C.S. With 666 Original Illustrations. Second Edition. St. Louis: C. V. Mosby Company, 1924. Pp. 784.

FASTING AND UNDERNUTRITION. A Biological and Sociological Study of Inanition. By Sergius Morgulis. New York: E. P. Dutton and Company, 1923. Pp. 407.

ANATOMIE DES MEMBRES. Dissection—Anatomie Topographique. Par le Dr. Ch. Dujarier. Deuxième Édition, conforme au premier tirage. Paris: Masson et Cie, 1924. Pp. 422.

ACTIONS AND USES IN MEDICINE OF DIGITALIS AND ITS ALLIES. By Arthur R. Cushny, M.A., M.D., F.R.S. London and New York: Longmans, Green and Co., 1925. Pp. 303.

MODERN METHODS IN THE DIAGNOSIS AND TREATMENT OF RENAL DISEASE. By Hugh Maclean, M. D., D. C. Second edition, revised and enlarged, with four colored plates. Philadelphia and New York: Lea & Febiger, 1924. Pp. 110.

TEXTBOOK OF PHYSIOLOGY. For Medical Students and Physicians. By William H. Howell, Ph.D., M.D. Ninth Edition, Thoroughly Revised. With 308 Illustrations. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 1069.

HANDBUCH DER BIOCHEMIE DES MENSCHEN UND DER TIERE. Herausgegeben von Prof. Dr. Phil. et Med. Carl Oppenheimer. Zweite Auflage; Leiferung 16, Band V (S. 1-160), Bog. 1-10; Leiferung 17, Band IV (S. 353-544), Bog. 23-24. Jena: Gustav Fischer, 1924.

LE TRAITEMENT DE LA SYPHILIS. Par les Composés Arsenicaux et les préparations Bismuthiques, avec l'exposé des nouvelles méthodes de laboratoire. Par Dr. Lacapère, avec la collaboration du Dr. Ch. Laurent. Quatrième Édition, entièrement refonde. Paris: Masson et Cie, 1924. Pp. 341.

INTERNAL SECRETIONS OF THE SEX GLANDS. The Problem of the "Puberty Gland." By Alexander Lipschütz, M.D. With a preface by F. H. A. Marshall, F.R.S. With over 140 Illustrations in the Text. Cambridge: W. Heffer & Sons, Ltd.; Baltimore: Williams & Wilkins Company, 1924. Pp. 53.

INFECTION, IMMUNITY AND INFLAMMATION. Study of the phenomena of Hypersensitiveness and Tolerance, and Their Relationship to the Clinical Study, Prophylaxis, and Treatment of Disease. By Fraser B. Gurd, B.A., M.D., C.M., F.A.C.S. St. Louis: C. V. Mosby Company, 1924. Pp. 329.

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Miscellany.

The Mystery of Death.—In an address on Folk Medicine, delivered before the Leeds University Medical Society and published in the *Lancet*, February 7, 1925, William Murphy, M.B., Ch.B., of Leeds, says:

"To primitive man we may well believe that death was an insoluble mystery. Intellectual man has not yet discovered a wholly satisfactory explanation of death—or of life, although science has formulated and discarded many theories on the subject. The great French philosopher, Descartes (seventeenth century), actually believed that the pituitary gland was the bond between body and soul. One step forward, however, we have made. We have learned to regard death as a natural event. Primitive man—if we may draw conclusions from the beliefs of savage tribes still in existence—was quite unable to visualize it as a natural occurrence at all, possibly because in his experience it was so frequently associated with violence. He connected death with wild beasts, drowning, lightning, or—and this much more rarely—with mysterious affections of his body which he could not understand or account for. So he came to attribute death and all physical suffering to supernatural causes, of which there would seem to have been three of paramount importance: 1, The anger of offended spirits; 2, the supernatural power of an enemy; 3, the displeasure of the dead.

"Spirits to our unsophisticated forefathers were an everpresent source of trouble, and disease was long regarded as a mark of the wrath of those powerful beings. Among certain Asiatic tribes a favorite treatment for disease of any kind was for the village sorcerer to thrash the patient until the demon was driven out of him. In Burmah, if thrashing proved ineffectual, the doctor was wont to trample on his patient's abdomen until he killed the demon.

"In England the Devil was long credited with the power of inflicting disease and also, if he felt so inclined, of curing it. He seems indeed to have been held in some respect as the head of the medical profession—a view which doubtless still claims some adherents! Sir George Mackenzie, writing in the seventeenth century, states that 'the Devil can cure disease because he knows its natural causes better than the physicians can, who are not present when diseases are contracted and who, being younger than he, must have less experience.'

"The power of enemies was scarcely less dreaded than the wrath of spirits. A curse was a potent cause of death or misfortune, though most commonly the desired effect was only obtained by the mediation of some person skilled in the practice of magic. The witch—or wizard as it sometimes was, though more rarely in England—might compass the evil by means of incantations or prayers—usually addressed to the Devil—but sometimes she required for the success of her spells something intimately associated with her destined victim, like a lock of his hair or a piece of his clothing. It seems probable that the oldfashioned nurse's eagerness to commit at once to the fire such things as pieces of nails or hair arose out of nothing more hygienic than this old superstition. A method still more favored by the witches was the burning of a waxen or wooden image of the person upon whom the spell was to work, in the belief that as the wax melted or the wood charred so the body of the victim wasted or was tormented. The 'evil eye' was for centuries, and, indeed, in some places still is, an object of superstitious dread. One writer even tells us that the reason why surgeons do not show wounds to every man is that they have observed that the influence of some eyes hinders the process of healing.

"The belief that the dead could cause suffering to the living probably belongs to a much later stage in the history of culture than either the fear of spirits or of witchcraft, and it has survived both of them. It is still commonly thought that if a corpse be allowed to remain in the house over a Sunday there will be two more deaths in the family. As late as 1887 the body of a woman who had died of phthisis was exhumed and her lungs burned because she was believed to be drawing the remaining members of her family into the grave after her. This story, I perhaps ought to add, comes from America, where perhaps even popular medicine may transcend common experience, as does the length of the American appendix! The belief in vampires is probably akin to this fear of the dead, a belief not yet extinct even in the civilized world. So recently as a couple of years ago a case was reported from Central Europe in which the body of a dead woman was taken from the grave and a stake driven through her heart—that having been for centuries the recognized means of dislodging the evil creature which was using the dead body to pursue its hideous work.

"To say that all misfortune was attributed to one of these three great causes would, of course, be inaccurate, but they were the most potent influences for evil and the most dreaded."

Recovered Lepers Discharged from Leprosarium.—Four lepers who went to U. S. Marine Hospital No. 66, Carville, Louisiana, the National Home for Lepers, a few years ago, have been discharged, according to a statement made by Surgeon General Hugh S. Cumming of the United States Public Health Service. They are no longer a menace to the public health, the disease having been cured, or, according to official parlance, "arrested." The conditions under which lepers are released from this institution are exceedingly rigid. They require special observation for a period of one year, including monthly bacteriological examinations to show that the leprosy bacillus is absent from the tissues. Certification of cure is also required from a board of three medical officers stationed at the hospital and experienced in leprosy.

The treatment at Carville includes the use of chaulmoogra oil, special preparations of mercury used intravenously, x ray therapy, surgery of superficial areas of involvement, hydrotherapy, and the violet ray. The results of treatment have been sufficiently encouraging at this institution to induce numerous other patients, of whom there are believed to be several hundred in the United States, to agree to their transfer. A special car fitted up for the purpose, and carrying a doctor and a nurse was used in the transfer last week of eleven patients from Florida, and seven were brought from California. There are at present 236 leper patients at Carville.

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The Shape of the Skull.—A Lecture on "The Cause of Skull Shapes" was delivered by Dr. Arthur Robinson, professor of anatomy in the University of Edinburgh, under the auspices of the Royal Anthropological Institute, in the rooms of the Geological Society, Edinburgh, on January 19th. He drew attention to the fact that the cranial and facial parts of the skull varied in shape and size at different periods of life, and that it was now generally admitted that the size of the cranial part depended on the amount of its contents. Since in normal circumstances these contents were mainly brain, it followed that the size of the cranium depended on the size of the brain. On the other hand, the cause of the shape of the cranium was still a matter of dispute, and a satisfactory explanation had to account, not only for differences in proportion, but also for the formation of localized expansions which were numerous and varied.

The two principal factors which might be assumed to have effect on cranial shape were environment and heredity. Environment might be considered to include the associated effects of climate and altitude and the immediate environment of the muscles attached to the skull bones. With regard to general environment, there was a fairly common idea that a special type of head was being evolved in America, but there was no definite proof that such was the case. It seemed impossible to avoid the conclusion that the shape of the skull depended mainly upon hereditary tendencies which worked under the law of genetic control. If that was the case, then the shape of the cranium depended upon the growth of the brain, and the growth of the brain was undoubtedly governed by the laws of heredity.—*British Medical Journal,* February 7, 1925.

Progress Made in Control of Cancer.—Dr. Howard Canning Taylor, of New York, professor of clinical gynecology at the College of Physicians and Surgeons, and president of the American Gynecological Society, was elected president of the American Society for the Control of Cancer at the annual meeting of the society held on March 7, 1925. Dr. Taylor, who has been the Society's vice-president and chairman of its executive committee, succeeds Dr. Charles A. Powers, deceased. Thomas M. Debevoise was reelected secretary and Calvert Brewer was again elected treasurer. Dr. Francis Carter Wood was elected vice-president.

In the annual report of Dr. George A. Soper, managing director, evidence was presented to show that the efforts of the society to acquaint the public with the early symptoms of cancer had borne fruit throughout the country. The latest report of the Pennsylvania Cancer Commission showed that in Pennsylvania from 1910 to 1923, the average time between the first symptoms and operation in superficial cancer cases had dropped from eighteen months to fourteen and six tenths months, and that the average time between which a patient consulted a physician and was operated on dropped from thirteen months to four and five tenths months. Where deep cancers were concerned, the results were even more striking. Twelve years of educational work had cut down the average time between the discovery of the first symptoms of superficial cancer and the first call on the doctor twenty per cent., and reduced the interval between the patients' first appearance at the doctor's and the beginning of medical treatment sixty-five per cent. in superficial cancer and seventy per cent. in deepseated cancer.

Reports from the fifty-three State chairmen of the society had shown that in each State patients were coming earlier to physicians and consequently with a better prospect of cure. Specific instances could be quoted of lives saved through the society's work. The society's efforts for the year had included systematic work among the public, members of the medical profession, nurses, dentists and students at medical colleges. The society's publications had all been revised to contain the latest information. Exhibits had been made at many notable meetings of professional men and women.

With reference to clinics, the cornerstone of a permanent institution had been laid in connection with the Medical School of the University of Minnesota, the funds having been provided by Mrs. George Chase Christian, a member of one of the society's committees. A temporary clinic had been successfully operated at Fall River, Massachusetts, under the direction of Dr. E. P. Truesdale of that city, aided by Dr. Francis Carter Wood.

In coöperation with the Connecticut Medical Society, the Connecticut Public Health Association and the Connecticut State Department of Health, the society had begun a three years' campaign in Connecticut during which it will turn to account the experience it has gained elsewhere in the matter of cancer control.

The director's report showed that inquiries for information have greatly increased during the twelve months. They included letters from physicians of England, Spain, Cuba and Italy who wished information to guide them in the conduct of campaigns for the control of cancer in their countries.

Dr. Soper recommended that during the coming year work be continued along present lines and broadened in some directions; that "cancer weeks" be generally held; that further efforts be made to enlist the coöperation of dentists, nurses and social workers; that the work undertaken in Connecticut be extended to other States, and that the survey conducted by the Philadelphia Cancer Commission be duplicated elsewhere in the country.

China Needs More Doctors.—The *World's Health,* January, 1925, calls attention to the urgent need for more Chinese doctors in China. Existing hospitals are seriously understaffed; private practitioners are relatively few; the number of doctors engaged in public health work is neglible; research work is in its infancy, and the death rate is very high. Under these circumstances the China Medical Board of the Rockefeller Foundation has requested the Council on Health Education to undertake a campaign for more doctors through the schools and universities, and has offered a total sum of $22,500 for a five year period to cover expenses. The council has agreed to undertake the campaign and a committee has already been appointed. Its plans include a survey of possible sources of medical students, a campaign to interest schools and scholars in a medical career, competitive prizes for essays on medicine, and scholarships to first class medical schools in China.

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Leprosy.—Sir Leonard Rogers has recently pointed out that the prevalence of leprosy is connected with damp heat, and that consequently tropical countries are most seriously affected, says the *Medical Press and Circular,* December 10, 1924. Of the estimated world statistics of leprosy, a number placed at three millions, one tenth are within the British Empire, and, of this tenth, two thirds are inhabitants of India. The tragic figure of the leper is there to be found in all grades of society from the rajah to the ryot. Of these only about four per cent. are in institutions, large numbers living in the rural districts where little medical aid is available and many cases of women and children are hidden away in zenanas. The need is emphasized of an increase in the number and size of existing institutions, the compulsory segregation of its victims, and the provision of facilities for treatment by the latest methods. The disease is said to be spreading in Africa, where the Mission for Lepers has established homes from which many patients have already been discharged free from active symptoms. A considerable number of such cases has been recorded in India, Korea, the Philippines and Brazil, where, in the single State of Para, it is estimated that there are 3,000 cases. Belem, the largest focus of leprosy in South America, has 1,700 lepers in a population of 120,000.

Health Hazards in the Manufacture and Use of Chlorine and Chlorine Products.—Thousands of tons each month of chlorine and bleaching powder are manufactured and used in the factories of New York State. There is more bleaching powder made in New York State than in all the rest of the United States put together, says the *Industrial Hygiene Bulletin* of the New York State Department of Labor. A survey of all New York State bleaching powder factories revealed the fact that this industry has gone back to the old process which was introduced into this country in 1879 and which has called forth legislation in England. During the past three years many paper factories and textile mills have given up the use of bleaching powder and are buying liquid chlorine in tank cars. The liquid chlorine is absorbed in milk of lime or a soda solution to make the bleaching liquid. The hazard of corrosive dust is thereby completely eliminated and the quantity of poisonous gas discharged into the air is comparatively nil. Although liquid chlorine is a highly poisonous chemical, it has been handled with remarkably few accidents. Efficient and well safeguarded apparatus has in general been provided. Large quantities of this poison gas are used in the metropolitan area of New York City.

Average Criminal Mentally Diseased.—More than half of ten thousand criminal delinquents examined by the National Committee for Mental Hygiene have been found to be mentally diseased, feebleminded, or otherwise mentally abnormal. This number includes inmates of prisons, reform schools, and those on probation to the courts. As a result of this examination Sing Sing will establish a psychiatric clinic to study each prisoner upon entering. The subnormal will be segregated from the normal and kept under state control. Massachusetts has passed a bill requiring the psychiatric examination of all prisoners sentenced for more than thirty days and those arrested more than once.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

BELLEVUE AND ALLIED HOSPITALS. City of New York. Twenty-first Annual Report, 1922. Pp. 108.

MEMORIAS DO INSTITUTO OSWALDO CRUZ. Anno Tomo XVI, Fasciculo 1. Rio de Janeiro: Manguinhos, 1924. Pp. 286.

REPORT OF THE SURGEON GENERAL, U. S. ARMY, Fiscal Year Ended June 30, 1924. Washington: Government Printing Office, 1924. Pp. 435.

LIVING ORGANISMS. An Account of Their Origin and Evolution. By Edwin S. Goodrich, F.R.S. Oxford: The Clarendon Press, 1924. Pp. 200.

FORTY-SECOND ANNUAL REPORT OF THE PROVINCIAL BOARD OF HEALTH OF ONTARIO, CANADA. For the Year 1923. Toronto: Clarkson W. James, 1924. Pp. 461.

GREFFE ANIMALE. Applications utilitaires au cheptel. Von le Dr. Serge Voronoff. Avec 59 planches dans le texte. Paris: Gaston Doin, 1925. Pp. 100.

THE NATURE OF DISEASE. By J. E. R. McDonagh, F.R.C.S. Part 1. Illustrated. London: William Heinemann (Medical Books) Ltd., 1924. Pp. 327.

PROCEEDINGS OF THE EIGHTEENTH ANNUAL MEETING OF THE ASSOCIATION OF LIFE INSURANCE PRESIDENTS. Held in New York, December 11 and 12, 1924. Pp. 216.

STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH. Reprints, Volume LI. New York. The Rockefeller Institute for Medical Research, 1924. Pp. 592.

REPORT OF THE HEALTH DEPARTMENT OF THE PANAMA CANAL FOR THE CALENDAR YEAR, 1923. By H. G. Fisher, Col. M.C., U.S. Army. Washington: The Panama Canal, 1924. Pp. 95.

ANNUAL REPORT OF THE SURGEON GENERAL, U. S. NAVY. Navy Department, Bureau of Medicine and Surgery. For the Fiscal Year 1924. Washington: Government Printing Office, 1924. Pp. 276.

THE CHEMICAL ASPECTS OF IMMUNITY. By H. Gideon Wells, Ph.D., M.D. American Chemical Society Monograph Series. New York: The Chemical Catalog Company, Inc., 1925. Pp. 254.

REPORT OF THE MEDICAL RESEARCH COUNCIL FOR THE YEAR 1923-1924. Committee of the Privy Council for Medical Research. London: His Majesty's Stationery Office, 1924. Pp. 142.

MICROSCOPIE DE L'OEIL VIVANT. Diagnostic Précoce et Sémiologie des Affections du Segment Antérieur de L'Oeil. Par F. Koby (de Bale). Paris: Masson et Cie, 1924. Pp. 240.

IL CONGRESO NACIONAL DE MEDICINA DE SEVILLA, 1924. Memoria Recopilada Presentada por el Doctor Felipe Scilia. Madrid: Imprenta de la Viuda deA. G. Izquierdo, 1924. Pp. 98.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES. For the Fiscal Year 1924. Treasury Department Document No. 2943. Washington: Government Printing Office, 1924. Pp. 310.

MITTEILUNGEN AUS DER MEDIZINISCHEN FAKULTAT DER KAISERLICHEN UNIVERSITAT ZU TOKYO. XXXI, Band 2. Heft; XXXII, Band 1, Heft, Band 2, Heft. Tokyo: Verlag der Kaiserlichen Unigersität, 1924.

THE MASSACHUSETTS MEDICAL SOCIETY DIRECTORY OF THE OFFICERS AND FELLOWS. Alphabetical and Local Lists as of January 1, 1925. Special Issue, The Boston Medical and Surgical Journal. Boston: Boston Medical and Surgical Journal, 1925. Pp. 185.

PRINCIPLES OF BIOCHEMISTRY. For Students of Medicine, Agriculture, and Related Sciences. By T. Brailsford Robertson, Ph.D., D.Sc. Second Edition. Thoroughly Revised. Illustrated with 57 Engravings. Philadelphia and New York: Lea and Febiger, 1924. Pp. 796.

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S 172

Miscellany.

Germicidal Rays.—A study of the germicidal action of ultraviolet rays, covering the range of wave lengths from just beyond the limit of the visible spectrum down to the shortest wave lengths emitted by a mercury vapor arc in a quartz lamp, shows that the shortest waves have the most pronounced and vigorous action, being capable, when sufficiently intense, of producing death with an exposure of only one second, says the *Medical Press and Circular,* March 4, 1925. Longer wave lengths required a greater intensity and acted much more slowly, but a fatal result ensued from waves as long as 365 millionths of a millimetre, which is the approximate length of the shortest waves visible to the human eye. Rays of sufficient intensity can kill bacteria (Bacillus coli communis) with an exposure of less than one second in duration, the requisite minimum intensity being obtained at a distance of six inches from the lamp. When the intensity is very low the effect is greatly retarded, and in some experiments an exposure of from seventy-five to eighty seconds was required. With still lower intensities there was some indication that the bacteria were stimulated instead of being killed. It was also found that the germicidal effect was proportionate to the total exposure, whether given all at once or divided into several short exposures with intervening periods of rest.

Tobacco and Efficiency.—By far the most important contribution yet made to our knowledge of the physiological and psychological effects of smoking, says the *Nation's Health,* March 15, 1925, is the recent monograph by C. L. Hull [*The Influence of Tobacco Smoking on Mental and Motor Efficiency.* Psychological Review Co., Princeton, N. J.] reporting the results of an exhaustive investigation carried out in the psychological laboratories of the University of Wisconsin.

Previous work, admirably summarized by Professor Hull, has clearly indicated that smoking causes an increase in heart rate (Payne) and interferes with the precision of neuromuscular reactions (Blickley, Lang, Johnson, Froeberg). Studies in regard to the effect of tobacco upon muscular fatigue and upon mental efficiency have, on the other hand, been more or less unsatisfactory, either as a result of paucity of data or of lack of adequate control.

In Hull's work eighteen subjects were used, half of them habitual smokers and the other half nonsmokers. The problem of control was admirably taken care of by an ingenious procedure which apparently eliminated any possible effect of suggestion. The fundamental test dose was the smoking of a large pipe of mild tobacco for a period of twenty-five minutes. During this period the subject was blindfolded and on the nontobacco days there was placed in his mouth an empty pipe equipped with a heating coil and containing a little moist asbestos plaster. The subject, placidly drawing in warm moist air through this apparatus, and smelling the pipes of other subjects in the room was quite unable to tell whether he was smoking tobacco or not. Indeed these innocent victims of diabolical psychological ingenuity had no idea that they were not smoking every day.

The outstanding results from this investigation were to show that, so far as physiological processes are concerned, smoking, under the conditions used, markedly increases the pulse rate and markedly increases tremor of the hand, confirming and extending the results of earlier observers. In the psychological field, the result which emerges with most complete statistical force is an influence upon speed in addition, unfavorable in the nonsmokers, favorable in the habitual smokers. The results of other tests, though statistically less convincing, lead the author to suggest that ordinary routine thinking is favored by tobacco while the formation of new associative bonds is hindered.

Dr. Hull has made it clear that an habitual smoker's pipe stimulates his heart but interferes with the steadiness of his hand.

Mortality of Physicians.—Casper, in 1835, found from statistics that physicians were the shortest lived of all the professions and occupations he had investigated, and ascribed the fact to the great demands on physical and mental strength that were associated with the habit of life, says the *Medical Press and Circular,* March 4, 1925. His conclusions, however, have not been generally accepted since the basis upon which his method was founded was unscientific. Later researches by German physicians and statisticians proved that during the second half of the nineteenth century, the mortality of medical men was somewhat lower than that of the male population as a whole, but considerably higher than that of the other academic professions. More recently, Freudenberg has published an article on the subject based upon statistics from 1920 to 1923. He first compared the medical mortality with that of German males during that period, secondly with the medical mortality of fifty years ago, and thirdly, with that of English physicians during the same period. Thence it appears that the mortality from infectious diseases, especially typhoid, typhus, and tuberculosis, is much less than formerly, and very noticeable is the decline in affections of the nervous system.

In members of the academic professions, venereal diseases are frequent, this being attributed to comparatively late marriage. The central nervous system in brain workers seems particularly nonresistant to syphilis; and, in addition, there is the well known predisposition to general paralysis and tabes among Jews, who are well represented among German physicians. The great progress in the prophylaxis and treatment of syphilis has greatly diminished the medical mortality from that disease and its sequelæ.

The number of deaths from pneumonia and pleurisy has decreased, and those from tumors remain stationary in number. From fifty-five to sixty-five years of age, affections of the circulatory organs are more common among physicians than the general population.

The effects of the war have been manifested in a higher mortality among the older age groups, and an increase in suicide is probably due to the same cause. Of 217 physicians, sixteen committed suicide, owing for the most part to financial difficulties. In his comparison with English medical men, the latter showed a lesser mortality from tuberculosis, but a much greater from arteriosclerosis; and the incidence of suicide is much lower in England than in Germany.

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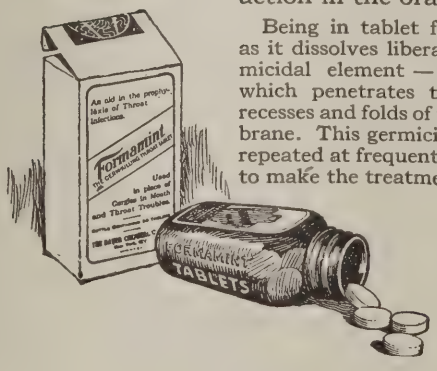

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South American Doctors Study Health Conditions in the United States.—Nine medical officials from Central and South America are in the United States in response to the invitation issued by Dr. H. S. Cumming, surgeon general, United States Public Health Service, to begin a two months' study of health conditions in the United States. Several weeks will first be spent in the Southern states looking into conditions there. This is part of the interchange of health officials provided for by the League of Nations. Last year Switzerland acted as host; the next country visited will be Jugoslavia. The work of the United States Public Health Service in guarding against epidemics, the work of state medical boards, and public hygiene questions will be given most of the visitors' attention.

Racial Mortality Statistics.—The remarkable differences in mortality exhibited by different race stocks in the United States offer some of the most puzzling and the most fascinating problems which confront the American sanitarian—problems with which no other country has to deal on quite so large a scale. The admirable volume recently issued by the census bureau, *Mortality Statistics, 1910-1920,* contains some of the most suggestive data along this line which have ever been made public, says the *Nation's Health,* March 15, 1925.

The figures cited below for New York State in 1920 are entirely typical of those presented for other states, Pennsylvania for example checking almost perfectly. They indicate that the adjusted death rate at all ages is low among persons of native birth and German birth, high among persons of Italian birth and highest among persons of Irish birth. The fairly low German rate is however due to a very low mortality in infancy (much lower than among the native born), balanced by a high mortality in old age. The Italians show an exactly reverse condition, a high infant mortality, overbalancing a low mortality in old age. The Irish, on the other hand, suffer from an excessive mortality all along the line and therefore show an enormously high adjusted rate.

DEATHS IN 100,000 IN NEW YORK STATE

Mother nativity	*Adjusted*	*Under one year*	*65-74 years*
United States	1,214	10,870	4,582
Germany	1,258	7,010	6,184
Italy	1,386	11,399	4,778
Ireland	1,751	11,184	8,116

Among the most interesting of these racial idiosyncrasies is that which manifests itself in relation to tuberculosis and pneumonia. Thus in New York State the adjusted death rates among persons of native birth were seventy-seven for pulmonary tuberculosis and 130 for all forms of pneumonia; among persons of Italian birth the tuberculosis rate rose to ninety-six and that for pneumonia to 242; while among persons of Irish birth the tuberculosis rate was 184 and the pneumonia rate 188. These figures are no accident. In state after state we find the same thing, pulmonary tuberculosis twice as high among the Irish as among the Italians but acute respiratory disease higher among the Italians than among the Irish. It seems very difficult to explain this phenomenon on the ground of any social or environmental differences. It would seem rather to be related to inherited constitutional susceptibilities.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

NOUVEAU TRAITE DE MEDECINE. Fascicule XXII, Muscles, Os et Articulations. Paris: Masson et Cie, 1924. Pp. 554.

GOD'S STEPCHILDREN. By Sarah G. Millin. New York: Boni and Liveright, 1925. Pp 319.

NOUVEAU TRAITE DE MEDECINE. Fascicule XIV, Appareil digestif. (Intestin). Paris: Masson et Cie, 1924. Pp. 570.

THE HEART RHYTHMS. By Paul Dudley Lamson, M. D. Baltimore: Williams and Wilkins Company, 1921. Pp. 100.

MEDICAL EDUCATION. A Comparative Study. By Abraham Flexner. New York: The Macmillan Company, 1925. Pp. 334.

SIXTIETH ANNUAL REPORT OF THE TRUSTEES OF THE BOSTON CITY HOSPITAL. Including the Report of the Superintendent. Pp. 127.

INTRODUCTION TO SCHOOL MEDICINE. By H. Leslie Cronk, M. D., D. P. H. Cant. London: H. K. Lewis & Co., Ltd., 1925. Pp. 236.

DYSPNEA. By James Howard Means. Medicine Monographs, Volume V. Baltimore: Williams & Wilkins Company, 1924. Pp. 108.

ON THE BREAST. By Duncan C. L. Fitzwilliams, M.D., F.R.C.S. Ed. and Eng. St. Louis: C. V. Mosby Company, 1924. Pp. 440.

WILLIAM CRAWFORD GORGAS. A Biography. By Marie D. Gorgas and Burton J. Hendrick. New York: Doubleday Page and Company, 1924.

LES MALADIES DES GLANDES ENDOCRINES. Par Prof. Knud H. Krabbe. Preface de M. le Docteur Stephen-Chauvet. Paris: E. François, 1925. Pp. 92.

KLEINE RASSENKUNDE EUROPAS. Von Dr. Sans F. R. Günther. Mit 20 Karten und 353 Abbildungen. München: J. F. Lehmanns, 1925. Pp. 208.

PHARMACODYNAMIE DES COLLOIDES. Tome II. Protéin thérapie. Transfusion du sang. Par W. Kopaczewski. Paris: Gaston Doin, 1925. Pp. 327.

THE TECHNIC OF LOCAL ANESTHESIA. By Arthur E. Hértzler, M. D., Ph. D., F. A. C. S. Third Edition, with 140 Illustrations. St. Louis: The C. V. Mosby Company, 1925. Pp. 272.

MITTEILUNGEN AUS DER MEDIZINISCHEN FAKULTAT DER KAISERLICHEN UNIVERSITÄT ZU TOKYO. XXI Band, 3 Heft. Tokyo: Verlag der Kaiserlichen Universität, 1924. Pp. 339-495.

LES PSYCHOSES ET LES FRONTIERES DE LA FOILE. Préface du Professeur Henri Claude. Par Dr. A. Hesnard. Bibliothèque de Philosophie scientifique. Paris: Ernest Flammarion, 1925. Pp. 274.

SERUM DIAGNOSIS OF SYPHILIS BY PRECIPITATION. Governing Principles, Procedure and Clinical Application of the Kahn Precipitation Test. By R. L. Kahn, M.S., D. Sc. Baltimore: Williams & Wilkins Company, 1925. Pp. 237.

DIAGNOSTIC ET TRAITEMENT DES MALADIES DE LA VESICULE BILIAIRE. Par l'excretion vesiculaire provoquee epreuves de Meltzer-Lyon et De Stepp. Par M. Chiray et Milochevitch. Medicine et Chirurgie Pratiques. Paris: Masson et Cie, 1924. Pp. 156.

ELEMENTARY ANATOMY AND PHYSIOLOGY FOR NURSES. Including Chapters on Psychology, Biology, Comparative Anatomy and Embryology. By H. Clifford Barclay, M.D., F.R.C.S. Ed. Third Edition. New York: William Wood and Company, 1925. Pp. 411.

HANDBUCH DER BIOLOGISCHEN ARBEITSMETHODEN. Von Geh. Med.-Rat. Prof. Dr. Emil Abderhalden. Abt. IV. Teil 12, Heft 2. Chemische, mikroskopische und physikalische Methoden der Blutuntersuchung. Berlin und Wien: Urban und Schwarzenberg, 1924. Pp. 177-276.

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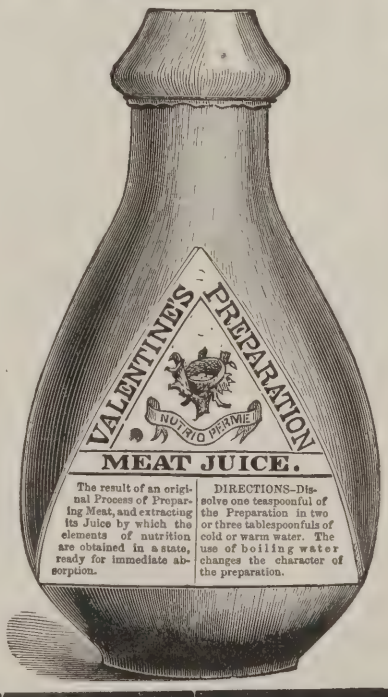
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Miscellany.

The Eyes in Hot Climates.—In a paper on Ophthalmology in Egypt, read at a recent meeting of the Section of Tropical Medicine of the Royal Society of Medicine, Mr. A. F. MacCallan, at one time director of the Egyptian Government Ophthalmic Hospitals, gave some valuable instruction on the care of the eyes in hot climates. While fatigue, ill health, and worry bring out latent defects in the eyes in any country, a hot climate causes greater fatigue than a temperate one, and this fatigue, he pointed out, may lead to fatigue indigestion with resulting physical depression. Worry, whether of official or of private origin, similarly may cause ill health. Under these conditions he found that trifling errors of refraction, or slight degrees of heterophoria, exerted effects quite out of proportion to their actual severity, and he emphasized the importance of careful correction of these errors, generally under a cycloplegic such as homatropine. In a highly sensitive patient, whose nerves were constantly being jarred by physical or mental discomforts, the correction of a very small degree of astigmatism might make all the difference between happiness and misery. In a country such as Egypt, the healthy emmetropic eye of the European becomes painfully affected by the sun's glare in the summer when motoring or riding along dusty roads or over the desert. It is the heat rays from the red end of the spectrum which cause this. To prevent the effects of glare, Mr. MacCallan advises the wearing of protective goggles of Crookes B or B2 material; but if discomfort is complained of the refraction of the patient should be verified under a cycloplegic. There are, he states, other varieties of protective glasses, which theoretically are more absorbent of the heat rays than Crookes glasses, such as peacock blue, Fieuzal, and amber, but in his own experience of a large number of cases he found that ordinary glass in which was included, if necessary, a very small ametropic correction, was all that was required. Sun, dust, and wind might also cause pinguecula and pterygium. In dusty seasons it is most advisable to wash from the eyelids the dust which collects there and which may contain septic material. This should be done three times a day. In many cases he found this simple precaution sufficient to prevent constantly recurring attacks of conjunctivitis.—(*Lancet,* March 14, 1925.)

Importance of Physique and Correct Posture in Relation to the Art of Medicine.—W. A. Cochrane (*British Medical Journal,* February 23, 1924). maintains that according to his findings the teaching of anatomy should be put on a basis to include all the types of anatomical structure. This is evidenced by the patients who have not the normal structure. A study of physiology with reference to special structure should also be made. In the make-up of creatures so markedly different as the slender and heavy, there is sufficient of interest to note that the types apparently carry their own potential of disease. In the study of a large group of chronic patients it was noticed that tuberculosis and mental disorders of the acute type, the hyperglandular disturbances, chronic arthritis of the atrophic type, sympathetic hypertonus and neurasthenia, were commonly associated with the slender type. Arteriosclerosis, hypertrophic arthritis, chronic diseases of the kidney, gallstones, degenerative mental disorders and vagus hypertonus were with the heavy type of structure.

Problems relating to man's posture have a direct bearing on medical and surgical practice. Many of the chronic conditions requiring treatment represent a derangement of the mechanism which regulates and maintains the proper and correct posture of the body. The physical conditions of health must be established. Much can be offered by the orthopedic surgeon along the lines of physical reconstruction by team work and cooperation by physician, surgeon and orthopedist. Physical education in the young, which is now being very much neglected, should be carried out along the lines of proper appreciation of the proper posture and its resulting efficiency.

The Toxicity of Emetine.—R. N. Chopra, B. N. Ghosh, and Premanker De (*Indian Medical Gazette,* July, 1924) tabulate the results obtained by injection of emetine hydrochloride in rabbits and present the following conclusions: Emetine is a general protoplasmic poison having a selective action on the cells of certain organs in the rabbit. The parenchyma of the heart muscle is one of the earliest to be affected, the changes being cloudy swelling of the muscle fibres and disappearance of transverse striation; shrinking of the muscle fibres; atrophy of fibres and their replacement by connective tissue cells. These may be the cause of some of the cardiac symptoms which occur in the course of injections in patients. The presence of petechial hemorrhage at the site of injection and in other organs shows that emetine has a selective action on the endothelium of the capillaries. The liver and kidneys are also affected later, the changes being chiefly congestion and fatty infiltration of the parenchyma. A smaller number of injections are required to cure the disease if these are combined with large doses of bismuth subnitrate or carbonate by the mouth.

Posology of Beverages.—P. L. Violle (*Lancet,* May 17, 1924), as a result of his fractional diuresis test, asserts that in cardiovascular affections beverages should be taken with the patient reclining, and preferably on awakening in the morning and on retiring for the night. As far as possible drinks should be taken in small quantities at a time and not during meals. In a general way beverages should be reduced in proportion to the degree of cardiac insufficiency present, or, in other words, in proportion to the difference between orthostatic and clinostatic elimination. In delayed absorption from the digestive tract from gastric dilatation, beverages should be taken a long time after meals in divided doses, the patient in the recumbent position. In intestinal affections, such as profuse diarrhea, beverages need not be reduced, but should be given in such amounts as to bring the total quantity of urine as near normal as possible for twenty-four hours. In pathological portal hypertension, especially hepatic, the quantity of fluids which produce most abundant elimination should be determined by trial. In humoral disturbances, especially in retention due to chlorides, salt should be eliminated from the food and beverages should be adjusted to the reduced and uniform elimination.

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Early and Rapidly Progressive Lead Poisoning in Lead Paint Factories.—F. Heim, E. Agasse-Lafont, and A. Feil (*Bulletin de l'Académie de médecine,* July 22, 1924) call attention to the rapidity with which toxic lead manifestations may appear among workers in lead paint factories when inadequate protective precautions are taken. Within a few days after initial exposure to the lead many workers showed the lead line on the gums, basophilic degeneration of the red cells, or lead colic, parotitis, etc. Even though the workers left the factory within a few days or months, the risk of severe after results was not eliminated, one case, for example, developing a subacute and rapidly fatal pernicious anemia after having worked in lead for the first time for a few weeks only. Aside from insistence upon the customary precautions, which the workers are too often prone to neglect, clinical and laboratory examinations are of great value, especially a systematic examination of the blood of all the workers, preferably repeated at intervals of a few weeks or months in the men who are just entering upon the occupation entailing exposure to lead. This not only affords information of the average amount of lead intoxication prevailing among a body of workers but also detects promptly individual workers who, owing to neglect of precautions or unusual sensitiveness, are threatened with serious consequences unless they give up this form of occupation.

Aviation and Medicine.—At a meeting of the Royal Aeronautical Society on Thursday, March 5th, Lieutenant Colonel C. B. Heald, medical adviser to the Department of Civil Aviation, delivered a lecture on Some Medical Aspects of Air Transport. He pointed out that the medical questions of aviation were of interest not only to those directly concerned with flying—pilots, insurance companies, and the air traveling public, and to the whole medical profession—but to physicists generally; for in aviation, he said, we are dealing for the first time, so far as the history of mankind reveals, with life and work in three dimensions, and we are learning previously unknown facts about the mental and physical makeup of people subjected to strain and stress in a new environment. The medical work of civil aviation is not confined to the routine examination of pilots, although this naturally forms an important part of such work, but it has to take into consideration all matters concerning the general life of those associated with civil air transport, and all the general questions of hygiene and health organization that help to build up comfortable and efficient services. Colonel Heald gave a detailed description, illustrated by lantern slides, of tests employed on the medical examination of the pilot, and dealt at some length with the more general aspects of the career of the airman and the factors which influence his health and lasting powers. From these considerations some important facts emerge, showing that the estimation of complete fitness in flying men has given to clinical medicine a new viewpoint. And at this point the lecturer concluded that the measurement of physical conditions, as distinct from the detection of disease, demands a new technic, when results of a value as yet unreckoned may be clear. Colonel Heald believes that this new technic for estimating physical efficiency —in what manner each system of a particular individual will endure and function under stress and strain for that individual—will come, directly or indirectly, from our improving knowledge of electrical phenomena and the ultimate composition of matter, the outstanding features in the progress of medicine today being chiefly electrical. Colonel Heald's prophetic vision will not be dismissed as a baseless flight of fancy because a recent demonstration before two sections of the Royal Society of Medicine made clear only one thing—namely, that the subject was unready yet to leave the physical laboratory. Medicine, grappling with the problem of deciding the fitness of a man to adapt himself to a new element, has found that the criterions of health may not lie wholly in the stethoscope and sphygmomanometer, and Colonel Heald is logical when he says: "It would surely, therefore, be fitting if through this new science of aviation we should find our feet set on a new pathway, leading possibly to a definite understanding of those forces that Sir Oliver Lodge, Professor Richet, and the late Sir James Mackenzie have already sensed."—(*Lancet,* March 14, 1925.)

The Cancer Producing Factor in Tar.—E. L. Kennaway (*British Medical Journal,* March 29, 1924) states that the attempts made as yet to find the cancer producing substance among the known constituents of coal tar have given wholly negative results. Anthracene, phenanthrene, chrysene, picene, retene, truxene, acenaphthene, fluorene, acridine, carbazole, aniline, benzene, toluene, and xylene have been excluded by experimental tests; and either the experimental or industrial evidence, or both of these, is against the importance of naphthalene, the acids, bases, and other nitrogenous compounds, paraffins, olefines, and naphthenes. It now seems not unlikely that this substance is a compound, as yet unknown, which is unstable and present in amounts perhaps as small as those of the vitamines in foods; as is the case of some hormones, its identification may be long delayed even when very concentrated preparations can be obtained. The substances which are known to be present in coal tar have been isolated because they are specially abundant, or stable, or capable of forming well defined compounds; the unknown substances are unknown because they have not these properties, and the cancer producing substance may well be among them.

Reduce Fire Hazards by Removing Old Inflammable X Ray Films.—The Surgeon General of the United States Public Health Service has issued general instructions to remove from the clinical record files as many of the used x ray films of inflammable type as are not essential for record purposes. The storing of nitrocellulose films, especially when filed as a part of the clinical records, is, of course, well known to be a serious fire hazard and in conflict with the fire regulations of most cities. Boards of medical officers have been called in the various Marine Hospitals for the purpose. One of the larger institutions has eliminated approximately six hundred pounds of the old style used films from its records. The material has a small sales value. The use of fire resisting films which are not more inflammable than ordinary paper, and the storage of which, therefore, presents no special problem, was introduced in all Marine Hospitals on July 1, 1924.

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Study of Child Labor.—The New York State Industrial Commission announces that a study of 412 working boys and girls under sixteen years of age, in New York city, conducted at continuation schools, showed nearly half with physical defects. The defects for each child averaged 2.4. Almost one-fifth of the children had visual defects, tuberculosis was found in one per cent., and four per cent. had heart affections. Half of the children worked forty-four hours, and six per cent. contrary to law, worked more than forty-eight hours. One third of the boys had work requiring them to be on their feet the entire day, and one quarter of the girls sat during the entire day. One fourth of the children were provided with wholly inadequate chairs.

Birth Rate in Germany.—Dr. Simon and Dr. Lucht of the Prussian Bureau of Statistics have been studying the birth rate of Germany. In Prussia the downward trend, noticed since 1909, was accelerated during the war, and is now only 50 per cent. of the pre-war rate. However, the tendency has been for an increase in the proportion of male births. While up to 1914, the highest ratio was 106.38-100, since the war the ratio has risen to 108.03-100. Prussia has the highest percentage of male births. In Denmark, Switzerland, and Holland, the percentage of male births has not changed much since the war.

Fire Danger at State Institutions.—Considerable anxiety is felt over the fire hazards at the various municipal hospitals and institutions for care of children and the aged. Especially dangerous are the wooden buildings of the City Home, where over two thousand old and feeble men and women are cared for, many of whom without assistance, would be utterly unable to escape from fire. Many buildings are in such a condition that it would take disproportionate sums to repair them, and they should be replaced with new structures. In spite of endorsements by the State Charities Aid Association and other interested organizations, of the $1,500,000 asked for by Commissioner Coler for the elimination of fire hazards this year, only $200,000 was granted.

Large Drug Shipment to Greece.—Probably the largest drug shipment ever to leave an American port, consisting of fourteen million five grain quinine tablets, is on its way to Greece, where it will be used to combat the scourge of malaria existing in the refugee camps of that country. The repatriation of nearly 1,000,000 Greek nationals from Asia Minor unavoidably resulted in many of these being quartered in malaria country. The result was a scourge as dreaded as that of typhus. The liberal distribution of the quinine shipments of the American Red Cross has, according to the Greek Department of Hygiene, saved the lives of tens of thousands of the refugees and enabled countless others, who otherwise would have been unable to work, to reestablish themselves in their new homes.

Rearrangement of State Health Districts—A rearrangement of the districts of four District State Health Officers, involving a shift of three counties of New York nas become effective. Dr. E. R. Richie, Brewster, takes over Columbia County, formerly in the district of Dr. Huntington Williams, Albany. Westchester, formerly in Dr. Richie's district, goes to Dr. Richard Slee, who is stationed for the present at Rockville Centre, Long Island. Rockland County is transferred from Dr. Slee's district to that of Dr. Frank Laidlaw, Middletown. From September 1st the four districts will be composed as follows: Dr. Williams, Albany, Renssalaer, Green, and Schoharie. Dr. Richie, Columbia, Dutchess, and Putnam. Dr. Laidlaw, Ulster, Sullivan, Orange, and Rockland. Dr. Slee, Westchester, Nassau, and Suffolk.

Wilmer Foundation.—An announcement has been made that the three million dollar endowment fund had been completed for the Wilmer Institute, devoted to teaching research, and hospital care, in connection with Johns Hopkins University. The money (with the exception of one million from the General Education Board) has largely been raised by friends and patients of Dr. William Holland Wilmer, of Washington, and it will enable him to devote his time to research on diseases of the eye. Mrs. Aida de Acots Root of New York, whose eyesight Doctor Wilmer saved, learned that he had himself paid a deficit of $6,000 in the operation of his hospital, and started to raise sufficient money to enable him to devote at least part of his time to research. Johns Hopkins University has assigned to the Institute a building and land valued at $200,000.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

INDUSTRIAL DISEASES. Rapid Reference Manual. New York State Department of Labor, Division of Industrial Hygiene, 1924.

MEDICAL SCHOOLS OF THE WORLD. Division of Medical Education, the Rockefeller Foundation. New York: The Rockefeller Foundation, 1924. Pp. 26.

DIE BEZIEHUNGEN DER GENITALORGANE ZU HAUTVERÄNDERUNGEN. Von Dr. Kurt Wiener. Sammlung zwangloser Abhandlungen aus dem Gebeite der Dermatologie und Syphilidologie, Neue Folge, Heft 6. Pp. 77.

FIRST REPORT ON MARRIAGE STATISTICS IN NEW YORK STATE. (Exclusive of New York City.) For the three years 1916, 1917, 1918 combined and for the year 1919. By Otto R. Eichel, M.D., Director, Division of Vital Statistics. Pp. 135.

WURZRURGER ABHANDLUNGEN AUS DEM GESAMTGEBEIT DER MEDIZIN. Di Nichttuberkulösen Lungenerkrankungen im Rontgenbilde. Von Dr. Max Cohn. Neue Folge, Band I, Heft 10; Der Ganzen Reihe 21, Band. Leipzig: Curt Kabitzsch, 1924. Pp. 439.

MONOGRAPHS OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH. No. 20, Experimental Studies of Yellow Fever in Northern Brazil. Five plates. By Hideyo Noguchi, M.D., and others. New York: The Rockefeller Institute for Medical Research, 1924. Pp. 36.

DER AUSFALL DES KOPFHAARS UND SEINE BEHANDLUNG. Von Prof. Dr. med. Felix Pinkus. Zweite Auflage. Sammlung zwangloser Abhandlungen aus dem Gebiete der Dermatologie und Syphilidologie. III Band, Heft 1. Halle a.S.: Carl Marhold, 1924. Pp. 65.

BEZIEHUNGEN DER EKZEMATÖSEN ERKRANKUNGEN ZU INNEREN LEIDEN. Von Hofrat Prof. Dr. S. Ehrmann. Sammlung zwangloser Abhandlungen aus dem Gebiete der Dermatologie und Syphilidologie, Neue Folge, Heft 5. Halle a.S.: Carl Marhold, 1924. Pp. 56.

PRACTICAL MEDICINE SERIES. Volume IV, Pediatrics, Edited by Isaac A. Abt. M.D., with collaboration of Johanna Heumann, M.D. Under the General Editorial Charge of Charles L. Mix, A.M., M.D., Series 1924. Chicago: The Year Book Publishers, 1924. Pp. 381.

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON HEALTH PROBLEMS IN TROPICAL AMERICA. Held at Kingston, Jamaica, July 22 to August 1, 1924, by Invitation of the Medical Department, United Fruit Company. Boston: United Fruit Company, 1924. Pp. 1009.

ENTEROGENE ENTSTEHUNG DER MAGEN-UND-WÖLFFINGERDARMZGESCHWÜRE. Von Prof. Dr. Adolf Posselt. Sammlung zwangloser Abhandlungen aus dem Gebiete der Verdauungs—und Stoffwechsel-Krankheiten, IX Band, Heft 1. Halle a.S.: Carl Marhold, 1924. Pp. 55.

CUTANEOUS XANTHOMA AND "XANTHOMATOSIS" OF OTHER PARTS OF THE BODY: PITUITARY XANTHOMA TOSIS—"XANTHOMYELOMATA" OF TENDON-SHEATHS, ETC.—AND THE "CHOLESTERIN DIATHESIS." By F. Parks Weber, M.A., M.D., F.R.C.P. With Seven Figures. London: H. K. Lewis & Co. Ltd., 1924. Pp. 36.

TEXTBOOK OF PRACTICAL THERAPEUTICS. With Especial Reference to the Application of Remedial Measures to Disease and Their Employment Upon a Rational Basis. By Hobart Amory Hare, M.D., LL.D. Nineteenth Edition, Enlarged, Thoroughly revised and Largely Rewritten Illustrated with 144 Engravings and 8 Plates. Philadelphia and New York: Lea & Febiger, 1925. Pp. 1061.

THE LIVER AND ITS RELATION TO CHRONIC ABDOMINAL INFECTION. By Charles Gordon Heyd, B.A., M.D., and John A. Killian, M.A., Ph.D.; STRUCTURAL CHANGES IN THE APPENDIX, GALL BLADDER AND LIVER FROM THE SAME PATIENT. By Ward J. MacNeal, Ph.D., M.D. Beaumont Foundation Annual Lecture Course III, 1924. St. Louis: The C. V. Mosby Company, 1924. Pp. 164.

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Miscellany.

The Anatomy of Twins.—Twin bodies of the uniovular type do not often come to the anatomist for examination. Hence not much is known with certainty or conclusive definiteness about the relations existing between the twins of this form, and the views advanced from time to time about the cause of twinning are little more than assumptions adopted to fill the void of ignorance on the subject. The theory of polyspermy as a cause is an example of such assumption; it is probably quite unsound and untenable from the nuclear and cytological point of view, and it can be pointed out that, in animals in which polyspermy normally or frequently occurs, the additional spermatozoa are noneffective to all appearance, while in a case like that of the armadillo, in which normally more than one embryo is formed from a single ovum, there does not seem to be polyspermy. All that can be said with certainty is that the uniovular twin is an end product of the process of dichotomy affecting the embryonic contents of the developing ovum, and the cause of its occurrence will be known when the explanation and meaning of dichotomy is understood. The result of dichotomy may be incomplete or complete division, and, in its axial form, ranges from the parasitic fetus and other monstrosities, through the partially attached individuals to the completely separated twins. In this last case the embryonic division may stop at this point, leaving the amnion undivided, or may even involve this, so that each individual possesses his or her own amnion. It is theoretically conceivable that the dichotomous process, beginning at the earliest possible moment, might lead to complete division of the whole ovum, so that each fetus would have its own chorion and placenta; but the occurrence of such a condition has never suggested itself to any observer, and a single chorion and placenta may thus be considered a proper accompaniment of uniovular twins. This, in fact, seems to be the most valuable criterion, in practice, in deciding on the nature of twin births. Those of opposite sex are not uniovular; when of the same sex they may or may not be so, but when they are enclosed in a common chorion, or—the same thing—have a common placenta, they are uniovular. When such details as these are lacking in the birth history, it is not possible to give more than the negative pronouncement that twins of different sex are not uniovular.—*Lancet,* March 14, 1925.

French Medicine and Louis Pasteur.—A lecture on the great discoveries of French medicine was recently delivered at the Institut Francais du Royaume Uni in South Kensington by Dr. Cruchet, professor of the Faculty of Medicine, Bordeaux. Passing in review the history of the ancient University of Montpellier and the many illustrious physicians whom it had produced, he recalled the career of Rabelais who studied there under Rondeletius. And then coming to the time of Louis XIV and the physicians satirized by Molière, while claiming that even among them there were some great Frenchmen, he acknowledged that their work was eclipsed by that of Harvey and Sydenham, to whom he paid fitting tribute. In Dr. Cruchet's opinion the greatest of all medical men was Laënnec, whose *Treatise on Auscultation* was given to the world in 1819. It always appears strange to us to hear a Frenchman depreciate the achievements of Pasteur, when comparing them with the work of his compatriots. Like others we remember, Dr. Cruchet acknowledged him as a genius, but from the point of view of pure medicine he placed the great French physicians of the nineteenth century on a higher plane. It seems to be becoming the custom to labor the fact, denied by none, that the germ theory was no new idea, and to quote from earlier works what each critic is pleased to consider a prior conception of the microbial origin of disease. It is very well to produce passages from the works of Fracastorius, from Edward Maynwaring and other obscure seventeenth century philosophers, from Haighton the gynecologist and other forgotten authors, as Dr. Cruchet did, from the *Etude sur le virus of Jean Hameau,* published in 1836, which the lecturer considered superior "from the point of view of pure medicine," to the works of Pasteur. Which of these men, whatever his philosophical lucubrations, brought pure medicine even a foot's breadth nearer to the light? It remained for Pasteur to demonstrate the theory which had been suggested by others. He was a chemist, and as a chemist he demonstrated the secret of fermentation, and afterwards applied it to disease. *"Si j'avais l'honneur d'être chirurgien,"* he said; as if he had not done enough. In our conception, the genius of Louis Pasteur stands alone; and with profound admiration for his industry, his insight and his intellect, we shall continue to regard him as the greatest scientist of all time.—*Medical Press and Circular,* March 4, 1925.

Vital Statistics for 1924.—The Department of Commerce announces that birth rates for 1924 were higher than for 1923 in sixteen of twenty-five states in the registration area. The highest 1924 birth rate (31.9 in 1,000 of population) is shown for rural districts of North Carolina and the lowest (14.9) is for rural districts of Montana.

Death rates for 1924 were lower than for 1923 in twenty-three of twenty-nine states. In fact, record low rates appear for the following thirteen States: Connecticut, Delaware, Kansas, Kentucky, Maine, Massachusetts, Montana, Nebraska, Ohio, Pennsylvania, Vermont, Virginia and Wisconsin. The six States having higher rates for 1924 than for 1923 are: California, Florida, Mississippi, Oregon, South Carolina and Washington. The highest 1924 death rate (22.1 in 1,000 of population) is shown for the urban districts of Mississippi and the lowest (6.5) for the rural districts of Montana.

Infant mortality rates for 1924 are generally lower than those for 1923, as only three of the twenty-five states show higher rates in 1924. The highest 1924 infant mortality rate (121.6) appears for the urban districts of South Carolina and the lowest (51) for the rural districts of Nebraska. Infant mortality rates are shown for both years for forty-four cities of 100,000 population or more in 1920. For thirty-six of these cities the 1924 infant mortality rates are lower than those of the previous year. The highest 1924 rate (92) is for Trenton and the lowest (45.3) for Seattle.

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American Anthropologist Tracking Ancient Man.—A six months' search for the remains of primitive man on four continents has been begun by Dr. Ales Hrdlicka, curator of physical anthropology of the U. S. National Museum, now en route to Europe. He will also visit India from which, in the Siwalik hills, specimens of anthropoid apes with manlike characteristics have recently been reported. Straits settlements caves that have been inadequately explored will be visited by Dr. Hrdlicka and the sites of the discovery of the oldest man in the world, Pithecanthropus erectus, will be the reason for his trip to the island of Java. Skeleton collections of primitive aborigines will be examined in Australia and in Africa the site of the discovery of the mysterious Rhodesian skull will be visited. Dr. Hrdlicka will also confer with Prof. Raymond A. Dart, of Johannesburg, who recently found the Taungs skull, believed to be a man-ape and a precursor of man himself. On his expedition Dr. Hrdlicka will represent the Buffalo Society of Natural History as well as the Smithsonian Institution.

The First Book in English on Dentistry.—In 1686 Charles Allen, about whom the *Dictionary of National Biography* is silent, brought out in Dublin a book of fifty-eight pages, *The Operator for the Teeth, showing how to Preserve the Teeth and Gums from all Accidents as also the Description and Use of the Polican;* the only known copy is in the library of Trinity College, Dublin. In the following year, 1687, there appeared a second edition or reprint with an altered title, *Curious Observations in that difficult part of Chirurgery relating to the Teeth, shewing How to Preserve the Teeth and Gums from all Accidents they are subject to* [*Curious Observations on the Teeth.* By Charles Allen. The first known book on dentistry in the English language, 1687. London: John Bale, Sons, and Danielsson, Ltd. 1924.] ; seven copies are known to be extant, and from that in the British Museum (782, 1.5 (1)) a reprint has been made. Allen considered that he was the first to write on the subject, and Miss Lilian Lindsay, who contributes an introduction, remarks that Berdmore, nearly a century later, made a similar statement, and that the value of Allen's book is not so much its priority or its contents as that it is one of the rare examples of Dublin printing in the seventeenth century—probably one of the most disastrous that even distressed Ireland has ever experienced—when the hearts of writers and printers alike failed them for fear to publish. The surviving part of his teaching is the importance to be attached to the care of the teeth in early life, which is "conducive to the preservation of life and health of children . . . and to the preventing of all those infirmities wherewith they are afflicted." It is dedicated "To the most Honourable and Truly Learned The Physitians, Chirurgiens, and Apothecaries of the City of Dublin," and on the next page, under the original title "The Operator for the Teeth," has a proem beginning with the laudable and disarming sentiment, "Knowing that it is the duty of every man, and especially of such as live under a Civil Government, (where the general Interest always includes the particular) to contribute as much as he can (in his own station) to the publick Good." The work contains seven sections, dealing with: the Nature of the teeth; the alterations of the teeth, with their remedies; the corruption of the teeth, with their remedies, whereto is annexed the description and use of the polican; the restauration of the teeth; the toothake, looseness of the teeth, and decay of the gums, with their remedies; children's teeth; and the "acceleration of the teeth," which gives instructions how to hasten the growth of children's second teeth and also "those in men that are called the teeth of wisdom."—*British Medical Journal,* February 21, 1925.

Refraction of X Rays.—An accurate measurement of the refraction of x rays has recently been made by Professor Bergen Davis and his coworkers at Columbia University. The bending of the rays at the surface of matter is very small, but by proper refinements of apparatus it can be measured quite accurately. These measurements permit the computation of the number of electrons in the inner level of an atom. The number found is two, in agreement with the Bohr scheme of atomic structure. The possible refraction of x rays was indicated by the experiments of Stenstrom a few years ago. Recently Professor Manne Siegbahn, of Upsala, Sweden, succeeded in showing this refraction directly by the bending of the rays in passing through a glass prism.

Eugenic Marriage Laws.—In 1913 the State of Wisconsin passed a Eugenic Marriage Law, requiring every man who applied for a marriage license to provide a physician's certificate attesting his freedom from acquired venereal disease. Since then six States have followed the example, but thirty-seven others have rejected similar proposals. It has been assumed that their refusal is based upon the conclusion that the law fails to attain its purpose, but on the other hand, it may well be that as in this country, the restriction of marriage is viewed with disfavor, as too great an interference with the liberty of the subject. An investigation into the operation of the law of Wisconsin, founded upon information by questionnaire, has recently been published, from which it appears that the original Act did not require the Wassermann test. Two years later provision was made for free laboratory service by the State, requiring clinical and other tests when the examining physicians deemed them to be necessary. It appears that in spite of quite inadequate remuneration—the fee is fixed at two dollars—the examination is conducted in a regular and conscientious manner, although about one fourth of the physicians, practising within the State, report that they do not always perform physical examination, relying upon their personal acquaintance with the applicant. A two thirds majority was of opinion that the law is valuable in preventing the infection of brides, but many adverse criticisms were levelled against it. Among these it was argued that women are not examined, that infection is not prevented by the forbidding of marriage, that marriages prescribed in Wisconsin are celebrated in some other State, and that, in the absence of the requirement of laboratory tests in every case, the security against infection is false and incomplete. But however well founded these objections may be, the fact remains that the balance of opinion is in favor of the law and the restrictions it entails.—*Medical Press and Circular,* March 4, 1925.

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Simpler Beds Urged for Hospitals.—Hospital beds, about the simplest form of sleeping equipment made, have been further simplified through the efforts of the U. S. Department of Commerce. They are now made in thirty-three different lengths, thirty-four different widths and forty-four heights. Following a conference with hospital officials, the government recommends that the standard hospital bed should be seventy-eight inches long and thirty-six inches wide, with widths of thirty-three and thirty-nine inches when narrower or wider beds are necessary. A bed twenty-seven inches high is said to be the most convenient for nurses. The government and forty-six hospitals, manufacturers and associations have adopted this size as standard.

The American Hospital Association estimates that more than $350,000,000 is spent annually for new construction and equipment in the hospitals of the United States and Canada. The Department of Commerce says that a saving of only one per cent. by reducing the waste due to excessive variety in hospital equipment would mean the release of nearly $10,000,000 a year that could be expended for enlarging hospital facilities.

Dr. Burr Says Dickens's Characters Art Not Scientifically Accurate.—The numerous queer characters who populate the pages of Charles Dickens's books are correctly depicted from the viewpoint of the layman, who sees what he thinks he ought to see, but not when viewed by a specialist in mental diseases. This is the opinion of Dr. Charles W. Burr, professor of psychiatry in the University of Pennsylvania Medical School, who has applied to these fiction characters the methods which he uses in diagnosing mental disorders when called into a criminal court as an alienist.

"Dickens was an artist," says Dr. Burr, "and not a specialist in mental medicine. Just as the dying of a great actor on the stage is altogether unlike death as the physician sees it, so life seen with an artist's eyes is unlike life seen by the professor trained in the learning of the schools. Death as it really happens acted on the stage, would be flat, stale and uninteresting. Dickens describes a fairyland, not seldom a fairyland into which devils have intruded. This is the secret of his wide appeal spreading through space and lasting through time."

"Dickens was himself queer, at least in his early life; his father and mother were both impractical persons, but," says Dr. Burr, "many, if not all, the men who have done great things have been queer little boys."

"Sticklers for scientific accuracy criticize him adversely and say that no man of science could classify, that is, pigeonhole, Miss Flite, Miss Havisham and Krook. These men of the professional mind are, to say the least, a trifle hasty. There is a wide borderland in the world of mental life, whose inhabitants are neither sane nor insane, their thoughts are ruled by laws we know not of, they cannot be classified, and so different are the types that almost any combination healthy man can conceive may be met there. We men of science try to classify them and they call them paranoids, mattoids and many other names, but the country is a jungle full of strange animals still unclassified."

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

THE ARAB AT HOME. By Paul W. Harrison, M.D. New York: Thomas W. Crowell Company, 1924.

THACKER'S INDIAN MEDICAL DIRECTORY, 1924. Calcutta: Thacker's Directories, Ltd.; London: W. Thacker & Co., 1924.

ONE THOUSAND DOLLAR PRIZE CROSS WORD PUZZLE BOOK. Series 2, Twenty-five original puzzles. Boston: The Stratford Company, 1925.

HUMAN PSYCHOLOGY. By Howard C. Warren. Boston: Houghton Mifflin Company. London: Constable & Company, Ltd. Pp. 1919.

MANUEL TECHNIQUE DE MICROBIOLOGIE ET SÉROLOGIE. Par le Professeur A. Calmette, L. Nègre et A. Bouquet. Paris: Masson et Cie, 1925. Pp. 568.

PRINCIPLES OF SURGERY FOR NURSES. Illustrated. By M. S. Woolf, M.R.C.S., (Eng.). Philadelphia and London: W. B. Saunders Company, 1925. Pp. 350.

CONSULTATIONS DU MÉDECIN PRATICIEN. Guide de pratique médico-chirurgicale journalière. Par le Dr. Fred Blanchod. Paris: J.-B. Balliere et Fils, 1925. Pp. 584.

STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH. Reprints, Volume LII. New York: The Rockefeller Institute for Medical Research, 1925. Pp. 601.

HANDBOOK OF OPERATIVE SURGERY. By Sir William Ireland de C. Wheeler, M.D., F.R.C.S.I. Fourth Edition. New York: William Wood and Company, 1925. Pp. 441.

HANDBOOK OF BACTERIOLOGY. For Students and Practitioners of Medicine. By Joseph W. Bigger, M.D., (Dublin), F.R.D.P.I., D.P.H. New York: William Wood and Company, 1925. Pp. 413.

THE PHYSIOLOGY OF MIND. An Interpretation Based on Biological, Morphological, Physical and Chemical Considerations. Second Edition, Reset. Philadelphia and London: W. B. Saunders Company, 1925. Pp. 287.

LEHRBUCH DER KEHLKOPFKRANKHEITEN UND ATLAS DER LARYNGOSKOPIE. Von Dr. L. Grünwald, Dritte vermehrte und umgearbeitete Auflage, mit 112 farbigen Abbildungen auf 47 Tafeln, und 35 schwarzen Abbildungen im Text. München: J. F. Lehmanns, 1925. Pp. 312.

HEREDITY IN NERVOUS AND MENTAL DISEASE. An Investigation by the Association for Research in Nervous and Mental Disease. Report of the Papers and Discussions at the Meeting of the Association, New York City, December 27 and 28, 1923. Editorial Board: Charles L. Dana, M.D., Thomas K. Davis, M.D., Smith Ely Jelliffe, M.D., Henry Alsop Riley, M.D., Frederick Tilney, M.D., Walter Timme, M.D. New York: Paul B. Hoeber, Inc., 1925. Pp. 332.

HANDBUCH DER BIOLOGISCHEN ARBEITSMETHODEN. Herausgegeben von Geh. Med-Rat. Prof. Dr. Emil Abderhalden, Lieferung 136: Abt. XII, Methoden zur Erforschung der Leistungen von einzelligen Lebewesen, Heft 3, Spezielle Methoden, Untersuchungen an einzelligen Lebewesen, Pp. 462-702. Leiferung 137: Abt. XIII, Methoden der Immunitätsforschung und der experimentellen Therapie, Teil 2, Heft 3, Immunitätsforschung, Pp. 334-594. Lieferung 141. Abt. IV, Angewandte chemische und physikalische Methoden, Teil 9, Heft 3, Methoden zur quantitativen Bestimmung des Stoffwechsels des Gesamtorganismus von Organen und Zellen, Stoffwechsel, Pp. 331-436. Lieferung 142: Abt. IV, Angewandte chemische und physikalische Methoden. Teil 10, Heft 3, Quantitative Bestimmung des Gasstoffwechsels, Methoden zur Bestimmung des Gaswechsels bei Tieren und Menschen, Pp. 416-674. Leiferung 143: Abt. V, Methoden der Muskel und Nervenphysiologie, Theoretische Grunlagen der Gelenkmechanik; Graphische Methoden zur Darstellung normaler und pathologischer willkürlicher Bewegungsabläuse; mit 59 Abbildungen im Text; Pp. 246-390.

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Dr. Javier Ortis y Ferrer, *Physician to the Municipal Charity of Madrid, Spain:* "VALENTINE'S MEAT-JUICE has given the happiest results in cases of debility and in the asthenia produced by operations of confinements. In some cases of Tuberculosis it restored exhausted strength, and in every case where organic exhaustion manifested itself as an effect of disease."

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S 130

Miscellany.

Metabolism Studies with Chaulmoogra Oil.—Bernard E. Read (*Journal of Biological Chemistry,* December, 1924) says that in view of the benefit obtained in the treatment of leprosy by the use of both codliver oil and chaulmoogra oil, it was thought that the latter oil might have an action similar to codliver oil upon general metabolism. The present investigation was undertaken to study the influence of chaulmoogra oil upon calcium metabolism. A marked increase in urinary calcium was produced in rabbits by the administration of large doses of chaulmoogra oil or ethyl hydnocarpate. Dogs given small doses orally showed a marked increase in urinary calcium, and an increase in fecal calcium. Continued administration reverses this effect, and favors calcium retention. Prolonged hypodermic administration of ethyl hydnocarpate in therapeutic doses to dogs decreases the urinary calcium and favors calcium retention. Large intraperitoneal injections decrease the urinary calcium and greatly increase fecal calcium so that there is a hyperexcretion of calcium. The blood calcium showed an increase after administration of the hydnocarpates to dogs; large doses producing a fatal effect in rabbits cause a decrease in blood calcium with tetany. The chemical analyses made show that there is the development of a tolerance to the original effect of the drug upon metabolism, particularly as seen in the lessened local irritant effect upon the alimentary canal.

The Resistance of the Brain to Disease.—It often happens that a person full of years and wisdom, his brain at the very acme of its powers, succumbs to a disease which leaves that organ intact to the end, says the editor of the *Medical Press and Circular,* April 29, 1925. He goes on to say that when the life of a brain endowed with rare powers, amplified and strengthened by long years of strenuous endeavor, is suddenly brought to an end in the plenitude of those powers and through no weakness of its own, but as the result of disease in some other part of the body politic, the event is one calculated to make the thoughtful ponder on the mystery of things. Such cases are peculiarly tragic, the more so when the victim is a person of outstanding ability.

Two eminent men have recently died in the full possession of rare gifts—the one supreme in statecraft, the other supreme in art. Consider the case of Mr. Sargent. Here was a man whose work showed no falling off from its customary high standard. Up to the very moment of his death his hand posesssed that subtle trick of manipulating brush and pencil of which he alone held the secret: the heart ceases to beat, blood ceases to flow in the brain, and although for a brief spell some show of life persists in individual neurons, that neuronic interplay which is associated with mental activity is brought to a standstill: the vastly complex cerebral integrate is instantaneously broken up, and the mental personality, so far at least as its mundane existence is concerned, vanishes.

It would appear that this great artist succumbed to chronic Bright's disease and the associated cardiovascular complications. The cardiac hypertrophy, without attendant valvular disease, indicated a long standing augmentation of systemic peripheral resistance and consequent heightened blood pressure, all of which were the direct or indirect outcome of a morbid blood plasma.

A remarkable feature of cases such as this is that while the morbid blood plasma induces widespread degeneration, the cerebral neurons, of all cells the most highly organized and sensitive, are often surprisingly free from disease, so that the patient remains in full possession of his faculties.

This exemption is to be explained by the fact that in virtue of their importance, special precautions are taken by the organism to protect them from the nocuous influence of a toxic plasma. Between the blood plasma flowing in the cerebral capillaries and the cerebral neurons a special protective mechanism appears to have been placed for the purpose of intercepting the passage of nocuous substances into the perineuronic lymph spaces. We seem to have evidence of the existence of such a mechanism in the fact that compounds of arsenic and mercury circulating in the blood are for the most part prevented from entering those spaces, although they gain ready entrance to the plasma surrounding the nerve fibres of nerve trunks.

It is manifest that the protection thus afforded even if it exists at all, is far from perfect, for otherwise the brain would not react to toxins circulating in the blood.

Noncalculous Intermittent Biliary Obstruction.—E. S. Judd and V. G. Burden (*Annals of Surgery,* April, 1924) present twenty-four cases, of which they say that there seemed to be a little doubt that intermittent biliary obstruction was the main cause of symptoms. Stone in the common duct was suspected, but not found at operation. It is not generally recognized that the pancreas can be responsible for intermittent biliary obstruction. Intermittent obstruction at the outlet of the bladder can be caused by infection in the prostate, while obstruction, more or less permanent in character, results from hypertrophy or malignancy. The swollen, edematous gland of pancreatic lymphangitis, the type associated with cholecystitis, might in a similar manner cause intermittent biliary obstruction, colic, and even jaundice. The normal gallbladder functions as a tension bulb in the presence of common duct obstruction as in cases of carcinoma of the pancreas. After removal of the gallbladder any sudden obstruction to the common duct causes rapid distention of the proximal ducts with resulting pain. If the elasticity of the gallbladder has been destroyed by disease, or if it has been removed, pancreatitis may be the cause of biliary obstruction, severe colic and jaundice. This is probably the explanation of events in some cases of cholecystitis without stones, in which severe colic and jaundice have occurred. After reviewing the histories of these patients, the authors are convinced that an accurate diagnosis cannot always be made. The symptoms are those of intermittent biliary obstruction, the usual cause of which is stone in the common duct. The surgeon should not be disappointed if he occasionally fails to find a stone. Drainage of the ducts will relieve the symptoms in most cases.

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The Ship Surgeon's Chest.—A revised list of the medical stores which merchant ships will be required to carry after June next has just been revised by the Board of Trade. The drugs included in it have been selected by the Colleges of Physicians and surgeons and the Pharmaceutical Society—we seem to miss the Society of Apothecaries. Among those which must be carried on all ships having one hundred or more passengers, thereby entailing a ship's surgeon, are several which have been added since the last list was issued about twelve years ago, such as adrenalin, emetine, pituitary extract, hexamine and salol. There must also be sufficient sterilized dressings for one major operation. It is not so long ago since a Cox's key was among the instruments required. Though a relic of barbaric times, it was a most useful weapon, supplying the place of a whole armory of dental forceps, and in experienced hands capable of forceful, though far from painless, results. In those days tincture of arnica, a drug almost unknown to present allopathic pharmacy, was the panacea for sprains and contusions. Iodine was only used as a counterirritant—indeed, until quite recent years, it was never applied except to the unbroken skin.—*Medical Press and Circular,* March 11, 1925.

Effects of High Environmental Temperatures on the Organism.—Frederick B. Flinn, associate physiologist, office of Industrial Hygiene and Sanitation, United States Health Service, recently undertook research work for the purpose of obtaining a more intimate knowledge of the specific effects of high environmental temperature upon the individual organs and tissues of the body so that the more general effects as observed among men who are compelled to work where the air temperature is abnormally high could be more intelligently interpreted than has heretofore been possible. The following is a summary of his findings, which are published in *Public Health Reports,* May 1, 1925:

During an exposure of six hours to an environmental temperature of 20° or 30° C. there was a drop in body temperature, probably due to a decrease in muscular activity. At 40° there was an increase of one degree in body temperature without an initial drop. At 45° and at 50° the body temperature rose within an hour to such a height that it was deemed unsafe to continue the experiments.

The oxygen capacity of the blood showed no changes during the exposure to the different temperatures that can not be accounted for by the diurnal changes in the hemoglobin or the concentration of the blood due to excessive evaporation of water.

The oxygen content of the blood remained unchanged at 20°, but showed a drop at 30°, which is probably associated with the low rate of metabolism at this temperature. At 45° and 50° there is a slight increase in the oxygen content, due to the increased aeration of the blood at these temperatures; but this increase is not in direct proportion to the increased passage of air over membranes of mouth and throat.

At temperatures of 20° and 30° the alkali reserve remains unchanged, while at 40° there is a sharp fall during the first four hours, followed by a slower fall during the next two hours. At temperatures of 45° and 50° there is a rapid depletion of the alkali reserve from the beginning, which is almost identical for each of these two temperatures.

The carbon dioxide content follows the alkali reserve, except that at 30° there is a slight rise for the same reason that at the oxygen content falls.

The hydrogen ion concentration of the plasma remains unchanged during an exposure of the animal to a temperature of 20°, 30°, and 40°, but decreases at temperatures of 45° and 50°, due to the excessive pulmonary ventilation at those temperatures with the consequent washing out of carbon dioxide without a compensatory loss of alkali from the blood.

The concentration of blood sugar falls during an exposure to temperatures of 20° and 30°. This fall is probably associated with inactivity of the animal during the course of the experiment. At 40° it falls during the first two hours to increase during the following four hours. At 45° no change was noted during an hour's exposure, while at 50° there was a sharp rise during this time.

The blood solids at 20° and 30° showed only the usual diurnal changes. At 40°, 45°, and 50° the concentration of the blood increases with the environmental temperature, no initial drop being seen.

An increased air movement benefits the organism by delaying the deleterious effects, but apparently at the expense of the organism itself.

The free drinking of water during an exposure to high air temperature is of greatest benefit in maintaining the organism in a normal condition.

Abnormality Among Texas Criminals Abnormal.—Less than one third of the prisoners in the Texas penitentiary are mentally normal, and only eleven per cent. are free from obvious physical disease or defect. These facts are reported by the National Committee for Mental Hygiene following a survey of conditions in the penal institutions of Texas made at the request of the state. The committee urges a medical and psychiatric clinic for study and treatment of offenders, and better hospital facilities and a training school. It also urges that prisoners be given indeterminate sentences, so that they may be released when they are rehabilitated and are judged ready to become useful members of society.

"Psychiatry," says the committee, "does not subscribe to halfbaked theories of pseudoscientists, like those who recently ascribed all crime to socalled emotional insanity which has its seat in the brain, is inherited and incurable, and can only be prevented by sterilization. Neither does it subscribe to the maudlin sentimentality which would have no one locked up or punished. The psychiatrist does maintain that the mental and physical condition of the prisoner has a great deal to do with his conduct and that an effort must be made to understand his mind and personality before sound correctional treatment can be administered. Experts who have studied the penal situation believe that constructive criminology has reached such a knowledge of the criminal and his rehabilitation that we may safely and wisely make investments in buildings, apparatus, and personnel. Additional expense in the interests of crime prevention is true economy in the long run."

The committee's report says that the majority of the Texas prisoners are under thirty years of age and that much can be done to remold the personalities of young offenders into socially acceptable forms.

In recommending an infant food —consider its nutritive value first

Cleanliness, digestibility, and palatability are also of importance, but without nutritive value any food would be useless as a body builder.

FOR the infant, breast milk furnishes all of the requirements mentioned. There is no need to seek further for a better food because no one has as yet been able to prepare a formula which can be considered anything other than a second choice.

As a breast milk substitute there is no better food for the infant than Eagle Brand Milk. For more than four years the largest child-feeding clinic in the history of the world has been maintained in the Near East, and Eagle Brand Milk has met every requirement for a complete milk food for the infants and older children throughout this period.

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Amenorrhoea
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These conditions are usually disturbances of internal secretions and require internal secretion therapy.

"For the female organism is peculiarly susceptible to physiologic and pathologic changes in the general endocrine system."
Graves—*Gynecology*, 2nd Ed., 1921.

HORMOTONE

restores to normal the endocrine mechanism of menstruation.

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Breathing Capacity and Delinquency.—There is apparently an important connection between breathing capacity and delinquency among women. Recent investigations by Dr. Frederick L. Hoffman, consulting statistician of the Prudential Insurance Company of America, into the present day human physique, with a due regard to age, sex and race, has revealed among other interesting results the striking fact that normal women usually have a chest expansion about three centimetres greater than delinquents at corresponding ages. He says: "While delinquents apparently have a slightly better general physique than normal women, as indicated by a somewhat larger chest and abdominal circumference, their breathing power is distinctly less, and this vital inferiority may have an important bearing upon mental development, for otherwise physically delinquent women exceed rather than fall below the averages for the different bodily proportions as ascertained by painstaking measurements."

Dr. Hoffman's investigation included a larger number of individuals and has covered a considerable period. In normal women at thirty years of age the chest expansion averages 11.2 centimetres against 9.8 for delinquents. At ages beyond this, the difference is still more marked, being 10.2 for normal women and 7.6 for delinquents. Expressed in inches the differences are: Under thirty, the chest expansion is four and a half inches in normal women; four inches in delinquent women. Over thirty, the expansion is four inches in normal women; in delinquent women three inches.

Only in breathing capacity did the measurements disclose an inferiority among delinquents. Thus, says Dr. Hoffman, the abdomen, which is a fair index of nutrition, was eighty-eight centimetres circumference for normal women under thirty years, while for delinquent women it was ninety centimetres. Among normal women over thirty the abdominal circumference was ninety-four centimetres against ninety-three among delinquents. Average weight under thirty was 125 pounds for normal women and 130 for delinquents; over thirty the corresponding weights were 142 and 135 pounds.

The data from which he derived his findings and conclusions included more than four thousand measurements of both sexes of Caucasians, Negroes, Caribs and Indians of North, Central and South America. These measurements were all made under uniform methods either by himself or under his direction through the cooperation of health officers and physicians in charge of reformatories and correctional institutions.

Natural Science Courses in the Jungle.—Courses in the natural science of the tropics are to be carried on in the jungle during the coming summer by the University of Pittsburgh. The Tropical Research Station of the New York Zoological Society, at Kartabo, British Guiana, has been turned over to the university for several years. The main work will be carried on during the summer months, but a permanent custodian has been stationed at the laboratory, so that it will be available at any time. A group of fifteen students, under Professor S. H. Williams of the department of zoology, plans to leave in June.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

ARROWSMITH. By Sinclair Lewis. New York: Harcourt, Brace and Company, 1925. Pp. 448.

THE EDUCATION OF BEHAVIOUR. A Psychological Study. By I. B. Saxby, D.Sc. New York and London: G. P. Putnam's Sons, 1925. Pp. 259.

THIRTY-NINTH ANNUAL REPORT OF THE DEPARTMENT OF HEALTH OF THE CITY OF NEWARK, NEW JERSEY. For the Year Ending December 31, 1923.

SEXUAL HEALTH AND BIRTH CONTROL. By Ettie A. Rout. Foreword by Sir Bryan Donkin, M.D. London: The Pioneer Press, 1925. Pp. 71.

A MANUAL OF PLURIGLANDULAR THERAPY. By Henry R. Harrower, M.D. Glendale, California: The Harrower Laboratory, Inc., 1924. Pp. 288.

THE SURGICAL CLINICS OF NORTH AMERICA. Lahey Clinic Number, Volume 4, Number 6. Philadelphia and London: W. B. Saunders Company, 1924. Pp. 1359-1525.

ANNETTE AND SYLVIE. Volume One of *The Soul Enchanted.* By Romain Rolland. New York: Henry Holt and Company, 1925. Pp. 331.

DISEASES OF THE RECTUM AND PELVIC COLON. By Martin L. Bodkin, M.D., F.A.C.S. Illustrated. Second Edition, revised and enlarged. New York: E. B. Treat and Company, 1925. Pp. 487.

CHRONIC EPIDEMIC ENCEPHALITIS. By August Wimmer, M.D. With a preface by Sir Fredr. W. Mott. With eighty-five Illustrations and one plate. London: William Heinemann (Medical Books) Ltd., 1924. Pp. 335.

TUMORS OF THE SPINAL CORD. The Symptoms of Irritation and Compression of the Spinal Cord and Nerve Roots. Pathology, Symptomatology, Diagnosis and Treatment. By Charles A. Elsberg, M.D. With Three hundred and fifty-four illustrations. New York: Paul B. Hoeber, Inc., 1925. Pp. 421.

REPORT ON SECOND INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY. Rome, May-June, 1923. By Commander William Seaman Bainbridge, M.D. Reprinted from *The Military Surgeon,* December, 1924. January and February, 1925. Washington: The Military Surgeon, 1925. Pp. 148.

MENTALITY OF APES. With an Appendix on the Psychology of Chimpanzees. By Wolfgang Köhler, translated from the second revised edition by Ella Winter, B.Sc. With nine plates and nineteen figures. The International Library of Psychology, Philsosophy and Scientific Method. New York: Harcourt Brace and Company, 1925. Pp. 342.

HANDBUCH DER ROENTGENTHERAPIE. III. Band des Handbuches der gesamten medizinischen Anwendungen der Elektrizität einschliesslich der Röntgenlehre. Lieferung 8, Die Röntgentherapie bei chirurgischen Erkrankungen. Von Dr. med. Hans Holfelder. Mit 63 Abbildungen und 4 Tabellen im Text. Leipzig: Dr. Werner Klinkhardt, 1925. Pp. 911.

AN INTRODUCTION TO PRACTICAL BACTERIOLOGY. As applied to to Medicine and Public Health, A Guide to Bacteriological Laboratory Work for Students and Practitioners of Medicine. By T. J. Mackie, M.D. (Glas.), D.P.H. (Oxford), and J. E. McCartney, M.D., D.Sc. (Edn.). New York: William Wood & Company; Edinburgh: E. & S. Livingstone, 1925. Pp. 297.

THE MODERN HOSPITAL YEAR BOOK. Fifth edition, 1925. Annual Reference Volume on Building, Equipment, Organization, and Maintenance of Hospitals and Allied Institutions. Also a Current Purchasing Guide to Hospital Requirements. Published for Hospital Superintendents, Department Heads, Building and Equipment Committees, and Architects. Chicago: The Modern Hospital Publishing Company, 1925. Pp. 724.

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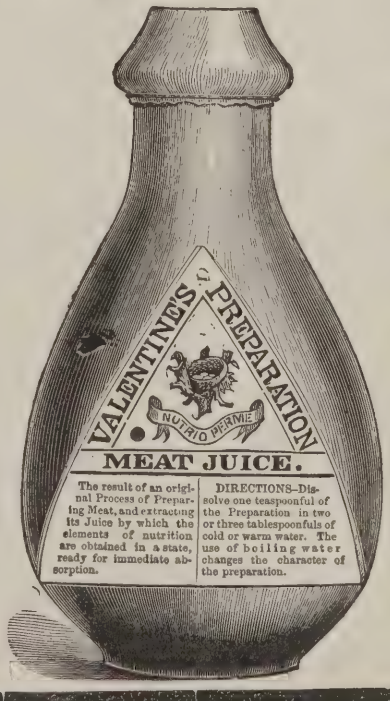
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The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.
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Miscellany.

Broadcasting Heart Sounds.—Under the supervision of Dr. R. Lutembacher, who is well known in Paris as a heart specialist, the beats of one healthy and six diseased hearts were recently broadcast from the Eiffel Tower station, says the *Lancet,* May 23, 1925. Dr. Lutembacher has hopes that in the future by this means a doctor may be enabled to follow the progress of a patient, though he does not suggest that a complete diagnosis of a case previously unseen would be possible. He declares that by the aid of an amplifier a patient's heart beats are clearly audible over an ordinary telephone. A further valuable feature of such experiments is that they may bring the country doctor and the hospital specialist into closer touch. This experiment is said to be the first of a series. Attempts on similar lines at Bristol and in Charlottenburg were recorded last year. Radio transmissions have since been carreid out on several occasions by the Welsh National School of Medicine from the British Broadcasting Company's station in Cardiff. On one occasion two cases with well marked cardiac bruits were correctly diagnosed by a medical man in Somerset. However, the aim of these transmissions was not so much to test the value of broadcasting heart sounds for the purpose of diagnosis of progress as to obtain information with regard to their magnification many hundreds of times by means of thermionic tubes. If a high degree of amplification without distortion is possible, then we have a new line of approach for investigating the nature of these sounds. It is possible that further light may be thrown upon the mechanism of their production or that vibrations hitherto undetected may be revealed. In exceptional circumstances the broadcasting of a patient's heart sounds might be of benefit, in that expert opinion not available at the bedside might be obtained from a distance. But it is probable that a short account of the patient's condition and symptoms would be more likely to bring help than the transmission of his heart sounds through the ether.

The Antimalarial Campaign in Ceylon.—Walter Peiris, L.R.C.P., (*World's Health,* April, 1925) says that malaria is prevalent in all parts of the island in varying degrees, and investigations with a view to eradicating the disease have been carried out for a number of years by an expert at the expense of the Government. Although malaria is not such a fatal disease as pneumonia, enteric, dysentery, influenza, phthisis, etc., its effects on the human system are so harmful that the high death rate of the island is thought to be, in some measure, attributable to it. A total of 23,326 deaths (11,608 males and 11,718 females) have been certified as being due to pyrexia. This certainly is an indication of the havoc caused by malaria. Further, the districts where the death rate from pyrexia is high are also reputed to be highly malarial, and where the death rate from pyrexia is low, the existence of malaria is said to be less pronounced. Pyrexia and malaria have jointly claimed as victims 5,600 persons out of every million of the estimated population. The number of persons killed by malaria and malarial cachexia in 1923—the latest year for which statistics are available—was 2,659, of whom 1,491 were males and 1,168 females as against 2,046 in 1922 and 1,796, the average for the decade 1913-22. This corresponds to a rate of 573 per million persons.

Ceylon is dependent on India for its food supply. In olden days, during the time of the Cingalese Kings, Ceylon was said to have produced sufficient rice to be able to export to other countries. There are thousands of acres that could be cultivated were it not for the malarial scourge. The seriousness of the problem from the point of view of the life and health of the citizen, and the importance of the question from an agricultural and economic point have induced the Government to appoint a Committee to control the malarial campaign which is to be carried out on an extended scale. The principal duties of the committee will be:

1. To receive reports from experts and advise upon these reports.
2. To consider the practical application of all suggested measures for the control of malaria as they may affect different sections.
3. To consider the best means of obtaining thorough cooperation from all sections of the community.
4. To consider the relative urgency and probable cost of proposed anti-malarial measures and submit estimates to the Government.

The campaign will be divided into four sections, viz., administrative, educational, medical and entomological, and it is understood that active control measures will be started simultaneously in several parts of the island.

X Ray Photographs Sent by Wire.—Quick x ray diagnoses by eminent specialists have been made possible by telephoning x ray photographs. A negative showing the bone structure of the human hand was sent from New York to Chicago in seven minutes on Wednesday, April 15th. Details were not lost in the procedure, and an accurate examination of the film was possible. "The time element in the diagnosis of an injury or ailment by a specialist is most important," said W. S. Kendrick, vice-president of the Victor X Ray Corporation of Chicago, following the reception of the first telegraphed x ray negative. "In complicated fractures or other bone injuries, a quick diagnosis is invariably desirable in order to prevent infection or other complications.

During the recent tornado in the Middle West, a woman received a severe fracture of the knee. The medical men available, who were not x ray specialists, were unable to treat her, and it was necessary to take her to New York. If an x ray film could have been sent by wire, a specialist would have been able to reply immediately with instructions for preventing permanent lameness or other complications without the necessity of going to New York. The possibility of sending the negatives by wire brings the specialist to the small community.

Dr. D. W. Coolidge, of the General Electric Company, has perfected a portable x ray equipment which a doctor can use anywhere by connecting it with the household lighting circuit. These widely used outfits have eliminated the necessity of moving a patient to a hospital for x ray examination, and now telephonic transmission of photographs indicates that soon it will not be necessary to take patients to large cities to secure the services of specialists.

In recommending an infant food —consider its nutritive value first

Cleanliness, digestibility, and palatability are also of importance, but without nutritive value any food would be useless as a body builder.

FOR the infant, breast milk furnishes all of the requirements mentioned. There is no need to seek further for a better food because no one has as yet been able to prepare a formula which can be considered anything other than a second choice.

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Reprints of clinical experiments with sweetened condensed milk will be sent upon request.

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Intestinal Stasis

as Lane has shown, is responsible for more diseases than any other one cause. Unfortunately, its correction presents many difficulties.

In AGAROL COMP., however, the practitioner has at his command, a unique combination of mineral oil, agar-agar and phenolphthalein, that not only will produce thorough elimination from the bowel without nausea, griping or distress, but also, when systematically employed, will restore the muscular tone and functional activity of the intestinal canal.

A constantly increasing number of medical men, therefore, are employing Agarol Comp. in the treatment of intestinal stasis, for they have found that its systematic use for a reasonable period means the permanent restoration of bowel function, after which it may be discontinued with the gratifying certainty that regular evacuations will follow without further assistance.

AGAROL is the *original* Mineral Oil—Agar-Agar Emulsion, and has these special advantages: Perfectly homogenized and stable; pleasant taste without artificial flavoring; freedom from sugar, alkalies and alcohol; no contraindications; no oil leakage; no griping or pain; no nausea or gastric disturbance; not habit forming.

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Amendments to the State Sanitary Code.—At a meeting of the Public Health Council held in New York City on May 5, 1925, regulation 37 of Chapter II of the Sanitary Code was amended to take effect June 1, 1925, and to read as follows:

Regulation 37. Sale of food forbidden in certain cases. When a case of diphtheria, epidemic (lethargic) encephalitis, epidemic or septic sore throat, amoebic or bacillary dysentery, epidemic cerebrospinal meningitis, paratyphoid fever, scarlet fever, smallpox, poliomyelitis, acute anterior (infantile paralysis), or typhoid fever exists on any farm or dairy producing milk, cream, butter, cheese, or other foods likely to be consumed raw, no such food shall be sold or delivered from such farm or dairy, except under the following conditions:

1. That such foods are not brought into the house where such case exists;

2. That all persons coming in contact with such foods eat, sleep and work wholly outside such house;

3. That such persons do not come in contact in any way with such house or its inmates or contents;

4. That said inmates are properly isolated and separated from all other parts of said farm or dairy, and efficiently cared for; and

5. That a permit be issued by the health officer, or in his absence by the district state health officer.

Scandinavian Medical Literature.—Those to whom English is the native tongue are greatly interested and not a little gratified by the growth of the study of the English language in the three great Scandinavian countries, says the *British Medical Journal,* April 25, 1925. Sympathy with them is traditional in England, where in some parts is a strong strain of Scandinavian blood, evidenced by place names and also by the construction of the common surnames. The extent of the movement in Scandinavia is indicated by the existence of flourishing societies. The Anglo-Danish Society has its headquarters in Copenhagen, the Anglo-Swedish in Stockholm, with branches in the university towns Upsala and Lund; the Anglo-Norse, established in Oslo (Christiania) has branches in Stavanger and Bergen. These societies are large and growing, and the *Times Literary Supplement,* from which we take this information, has stated recently that among their members there is "a quite extraordinarily high standard of English speech and culture." Evidence of the growth of a preference for English as a second language is afforded also by the fact that Scandinavian men of science show a growing disposition to publish the results of their researches in our language. We have mentioned this on two or three occasions within the last few months when giving an account of recent papers, and another instance is afforded by the papers of Krabbe and Kemp noticed in another paragraph this week. With one exception the articles to which we refer were published in the series of Scandinavian medical periodicals published under the general title *Acta.* The *Acta* dealing with surgery, gynecology, medicine, laryngology, pediatrics, skin diseases and syphilis, and radiology, are edited in Stockholm. The place of publication of *Acta Pathologica,* in which Kemp's paper appeared, is Copenhagen. Further, it will have been observed that Professor Moellgaard of Copenhagen not only contributed to our columns a paper on the gold treatment he has devised for tuberculosis, but wrote his book on the subject in English. First rate scientific work is being done in the Scandinavian countries, and we have also much to learn from them in matters of administration; Denmark, for instance, has solved its Poor Law problem with a completeness England may well envy. From the other point of view there is this to be remembered, that English is spoken by many more people who read than any other language, and that, owing to its directness and conciseness, when well written, and to the ease with which it assimilates Latin and Greek roots, it lends itself well to the expression of scientific facts and speculations. We may therefore look forward to a not distant time when the work done by the medical profession in Denmark, Norway, Sweden, and, we may add, Holland, will be better known than it is to-day, very much to the advantage of medical science throughout the world.

Danish Tuberculosis Treatment to Be Tested by Government.—A thorough test of the new treatment for tuberculosis, devised by Professor Mollgaard of the Royal Veterinary College of Copenhagen, will be made under the auspices of the U. S. Public Health Service before it will be available for distribution in the United States. The new preparation is called "sanocrysin." The material used consists of a preparation of gold in combination with thiosulphuric acid known as aurithiosulphate. Probably the sodium salt of this compound is what is used. On introduction into an individual this substance produces a rather severe reaction evidenced by nephritis, fever, skin rashes, and shock. This is interpreted by the Danish scientist as evidence of the solution of tubercle bacilli in the sick individual, as the same reaction with the same dose does not occur in normal individuals. To offset the severity of this reaction and in a measure to control it, Professor Mollgaard makes use of an antituberculosis serum, which is prepared by the Danish State Serum Institute, by injecting dead tubercle bacilli in either calves or horses.

After proving to his satisfaction that the cure was valuable in animals, Professor Mollgaard arranged with Dr. Secher of the Municipal Hospital in Copenhagen to test the cure out on human cases of tuberculosis. The report of this clinical investigation of its value was recently made in Copenhagen and the reports were favorable as to its value in certain types of pulmonary tuberculosis but doubtful as to its value in surgical tuberculosis and severe cases of pulmonary tuberculosis. Arrangements were then made for the testing of the material in England, but no reports of these experiments have been made.

An American pharmaceutical company has become interested in the distribution of this material in America, but inasmuch as part of the cure is a serum it is necessary, as provided by law in the interest of safeguarding the public health, that this new cure have the approval of the United States Public Health Service before it can be sold in the United States. The Public Health Service, through its Hygienic Laboratory, has arranged with the best equipped scientific men in this field to carry out a series of animal experiments and has arranged for the study of the cure in clinical cases in America under the direction of a Danish physician who has used it in Denmark. These studies are being pushed with the greatest rapidity.

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Ligation of the Splenic Artery in a Case of Essential Thrombocytopenia (Werlhoff's Disease).—Lemaire and Debaisieux (*Bulletin de l'Académe royale de médecine de Belgique*, March 29, 1924) endorse Franck's classification of the hemorrhagic diatheses, apart from hemophilia and scurvy, into essential thrombocytopenia (reduction of blood platelets) and to symptomatic thrombocytopenia of grave septic disorders, typhus fever, certain hepato-splenic syndromes, etc. These disorders are also separated from the angiopathic purpuras, including anaphylactic purpura, in which the platelet content of the blood is subject to marked variations in both directions. Essential thrombocytopenia sets in in apparent good health with cutaneous purpura, and especially, copious bleeding from the mucous membranes; rupture of arteries may result in voluminous hematomas. The platelets drop below 20,000 and may even apparently disappear. Giant platelets frequently appear. The coagulation time remains normal but the bleeding time is prolonged; retraction of the clot is slow and imperfect. Splenectomy, first recommended by Kaznelson has given excellent results in these cases. In the case in a boy of fifteen years reported by the authors, however, the general condition was so poor that splenectomy seemed too dangerous. The platelets were reduced to 2,000, there was copious intestinal hemorrhage and epistaxis, with extreme anemia, faintness on the least movement and a pulse rate of 140. Ligation of the splenic artery at the hilum was thought of but deemed too lengthy an operation, and ligation of the splenic at the upper border of the pancreas was substituted. A median incision was made under ether, the gastrohepatic omentum broken through, the stomach drawn downward and to the left, a buttonhole made through the peritoneum over the artery at about the third pancreatic branch, and the vessel ligated, the whole operation occupying but fifteen minutes. In nineteen days, the platelets rose steadily to 238,000, the red cells from 1,030,000 to 3,400,000, and the general condition showed radical improvement. The hemorrhages stopped three days after the operation. There were no evidences of pancreatic insufficiency in the stools or urine. No Jolly bodies were found, showing that functioning of the spleen was not annulled. Ligation of the splenic artery is believed to be indicated in these cases when the general condition is so poor as to preclude splenectomy.

Spinal and Cranial Injuries in Breech Deliveries.—R. N. Pierson (*Surgery, Gynecology, and Obstetrics,* December, 1923), presents the following conclusions:

1. Birth injury and shock in breech deliveries cause greater fetal mortality and morbidity than asphyxia.

2. Unnecessary haste in breech extractions, prompted by fear of fetal asphyxia, often causes obstetrical complications leading to birth injuries.

3. The diagnosis of death from asphyxia in breech deliveries is only justified when, a, there is strong clinical evidence of asphyxia, but none of injury; and, b, when complete autopsy shows characteristic signs of asphyxia, but none of injury.

4. The incidence of breech extraction may be diminished by, a, the practice of external version when possible; b, and by stricter limitation of the indications for version and breech extraction.

5. The high mortality and morbidity of breech deliveries may also be reduced by:

a. A management of labor and delivery that will effect full dilatation of the soft parts.

b. Accommodating, in delivery, the long axis of the child to the axes of the pelvis, thus avoiding dangerous angulations. And by accommodating the longest diameters of the body, shoulders, and head to the longest diameters of the pelvis, thus avoiding a dangerous degree of traction and suprapubic pressure.

Is the Virulence of Streptococci Increased in Putrid Tissue?—Heinz Küstner (*Zentralblatt für Gynäkologie,* February 2, 1924) found that putrid tissue favored the development of a general infection. This fact constitutes a theoretical reason for the emptying of the uterus in protracted abortion. The expectant treatment is successful only when the wall of granulation tissue is formed rapidly at a time when the virulence of the streptococci is increasing. If abundant other bacteria which suggest the presence of a putrid process are found in the uterine discharge in addition to virulent germs, the emptying of the uterus is absolutely indicated.

New Publications Received.

(We shall publish in future full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we shall review those in which we think our readers are likely to be interested.)

VAL SINESTRA. By Martha Morton. New York: E. P. Dutton Company, 1925. Pp. 275.

THE MATRIARCH. A Chronicle. By G. B. Stern. New York: Alfred A. Knopf, 1925. Pp. 291.

LA TRANSFUSION DU SANG. Etude Biologique et Clinique. Par P-Emile Weil et Paul Isch-Wall. Paris: Masson et Cie, 1925.

CLINIQUE MEDICALE DES ENFANTS. Affections de l'appareil Circulatoire. Par P. Nobécourt. Paris: Masson et Cie, 1925. Pp. 371.

PHYSICAL DIAGNOSIS. By W. D. Rose, M.D. Fourth Edition, with 319 Illustrations. St. Louis: The C. V. Mosby Company, 1924. Pp. 755.

THEORIES OF MEMORY. By Beatrice Edgell, M.A., Ph.D. Oxford, at the Clarendon Press; New York: Oxford University Press, 1925. Pp. 174.

HISTOIRE DE VITTEL. Création d'une Ville Thermale. Par Dr. P. Bouloumie. Avec 24 planches hors texte. Paris: A. Maloine et Fils, 1925. Pp. 376.

PEDIATRICS. By Various Authors. Edited by Isaac A. Abt, M.D. Volume VI. With 150 Illustrations. Philadelphia and London: W. B. Saunders Company, 1925. Pp. 736.

RECOVERY RECORD. For Use in Tuberculosis. By Gerald B. Webb, M.D. and Charles T. Ryder, M.D. Second Edition, revised. New York: Paul B. Hoeber, Inc., 1925. Pp. 79.

LORD LISTER. By Sir Rickman John Godlee, Bt., K.C.V.O., M.S., F.R.C.S. Third Edition, Revised. Oxford, Clarendon Press; New York: Oxford University Press, 1924. Pp. 686.

INTERNATIONAL CLINICS. Volume I, Thirty-fifth Series, 1925. By Henry W. Cattell, A.M., M.D. and others. Philadelphia and London: J. B. Lippincott Company, 1925. Pp. 301.

DISEASES AND DEFORMITIES OF THE FOOT. By John Joseph Nutt, M.D., F.A.C.S. Second Edition Completely Revised. Illustrated. New York: E. B. Treat and Company, 1925. Pp. 309.

LES EAUX MINÉRALES. Leurs modes d'action, leur emploi. Avec 27 figures et 16 planches hors texte. Par Maurice Perrin et Paul Mathieu. Paris: Ernest Flammarion, 1925. Pp. 280.

GRUNDZÜGE DER HYGIENE. Für Mediziner, Pharmazeuten und Arzte. Von Dr. med. et phil. Max Eugling. Mit 131 Abbildungen. Berlin und Wien: Urban & Schwarzenberg, 1925. Pp. 384.

BEITRÄGE ZU PROBLEMEN DER GYNAEKOLOGIE UND DES KARZINOMS. Festschrift. Zum 70 Geburtstag und 50 jänrigen Doktorjobiläum. Hofrat Dr. A. Theilhaber. Von Prof. Edelberg et al. Berlin: C. F. Pilger & Co., 1925. Pp. 205.

THE PRACTICAL MEDICINE SERIES. Volume V. Gynecology, Edited by Thomas J. Watkins, M.D., F.A.C.S.; Obstetrics, Edited by Joseph B. deLee, M.D., with the collaboration of J. P. Greenhill, M.D. Series 1924. Chicago: The Year Book Publishers, 1925. Pp. 534.

THE BLOOD. A Guide to Its Examination and to the Diagnosis and Treatment of Its Issues. By G. Lovell Gulland, M.D., F.R.C.P.E. and Alexander Goodall, M.D., F.R.C.P.E. With 29 Text Illustrations and 16 Colored Plates. Third Edition. New York: E. B. Treat and Company, 1925. Pp. 424.

THE DENTIST'S OWN BOOK. A Faithful Account of the Experiences Gained During Forty-six Years of Dental Practice, Including a Complete Bookkeeping and Recording System and a Description of the Management of a Dental Practice. By C. Edmund Kells, D.D.S. With 116 Illustrations. St. Louis: C. V. Mosby Company, 1925. Pp. 510.

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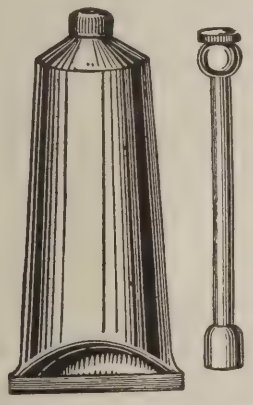

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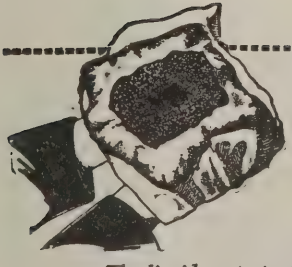

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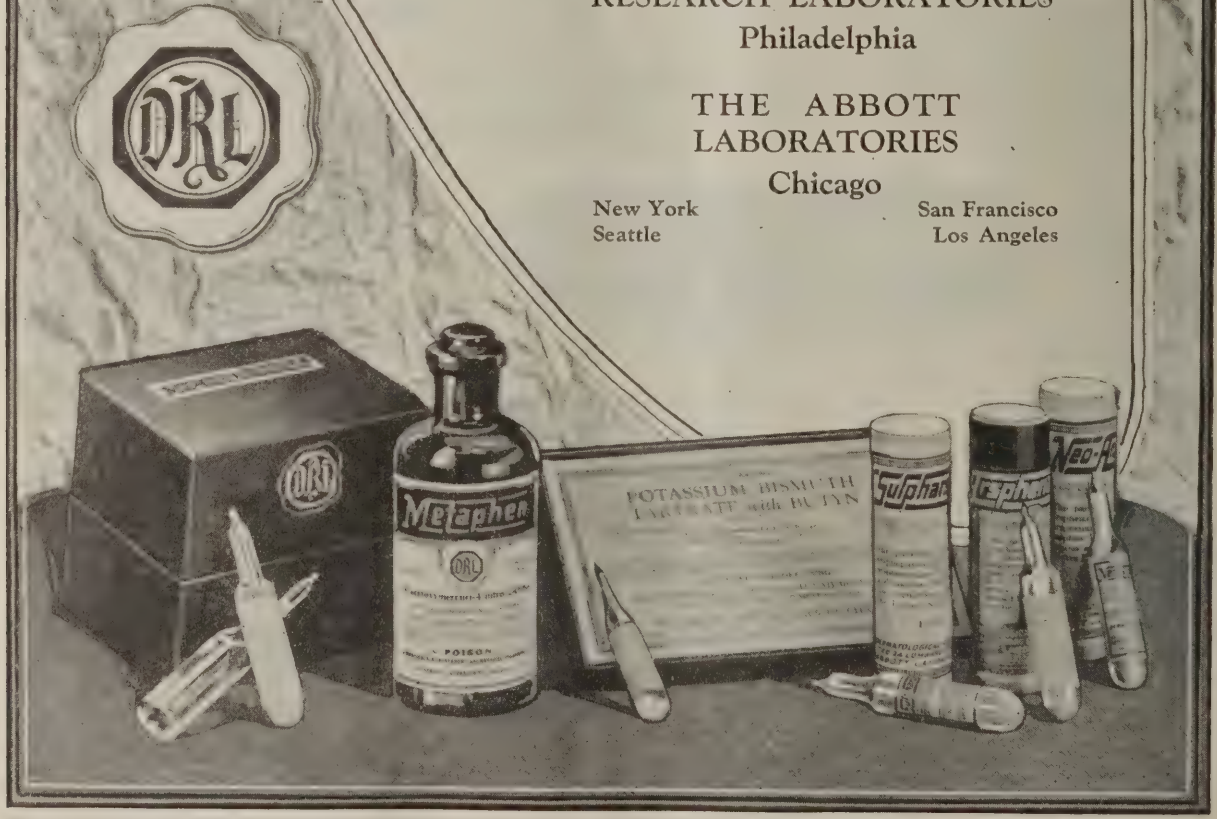

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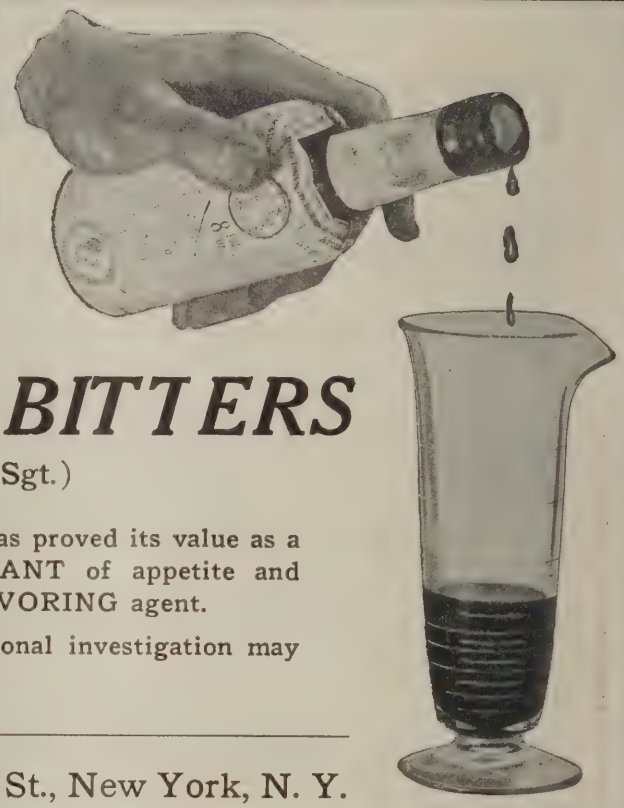

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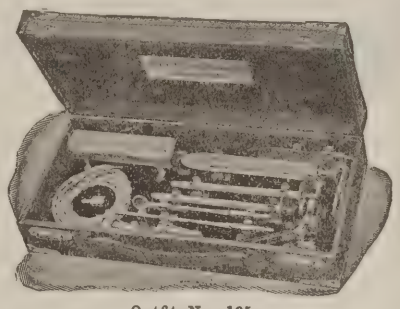

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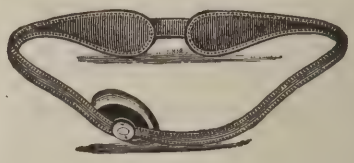

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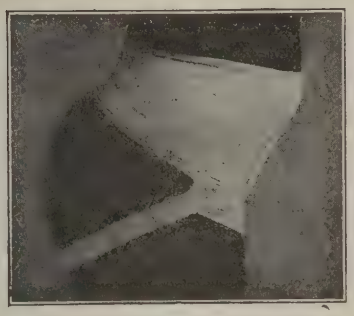

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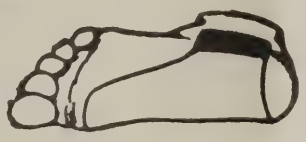

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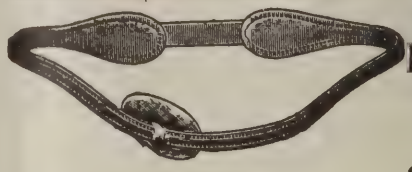

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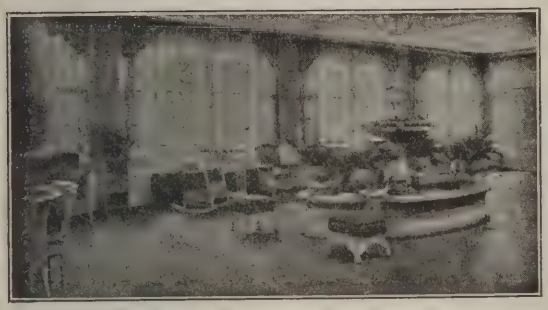

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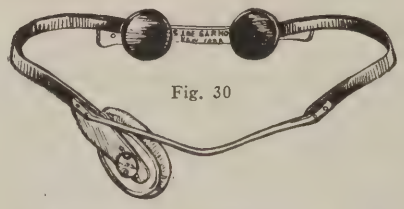

Fig. 30

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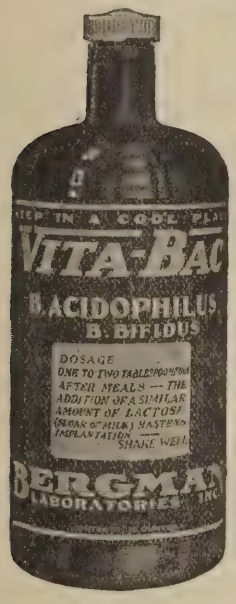

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